

THE  
FIVE  
TEARS

THE FIVE TEARS  
OF THE  
FIVE TEARS







**Journal**  
*of the*  
**Royal Naval Medical Service**



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## #Continued

Looking back over previous Editions we are conscious that as an act of disrespect (and about the funeral) some of the JOURNAL has always been a recurring feature. This time we are required to be light hearted and what better opportunity than this **TWICE A KNIGHT**

Congratulations and good wishes to our Director on his second Knighthood. This rare honour reflects the sterling qualities of his Deeds. It was an honour which as far as we are concerned was relayed by one only of his predecessors. We are delighted and wish him luck.

There is no break in the routine that at the end of the day's work in the Engineers' Staff Building, the Commanders pass his door, knock the Director's door before leaving and say 'Knight, Knight'.

## GLOOM AT THE TOP

The rumours and the rumours surrounding the recent outcome of the higher promotions make that the hierarchy with gloom and despondency. The man was run in court on a dull day but neither and the results were announced three months later! During this period transport drivers and senior officers were seen going with such other with looking signs and lost signs. Many of us had joined the leader's vehicles of Little Road and looked up at the little black chimney on the top of The Building for the puff of red smoke which would announce the outcome of the new Director. Now that the dust has settled and we have shaken off our discontent at the delay in the promotion chain of the previous syndrome, we begin to offer our unstated congratulations to Surgeon Rear Admiral Dick Colclough on his elevation for the Director's Chair. We know that this will be warmly welcomed throughout the British.

Congratulations also to Surgeon Captain Dudley Good and Eric Broadbent on their promotion to Surgeon Rear Admiral.

## DOCTORS ORDERS

While we are in the congratulatory mood let us begin to offer them also to those of our colleagues whose names appear in the New Times Bureaux List and whose names are at the end of this volume. To them we say: well done!

## APOLOGIES

The Editor wishes to offer his sincere apologies to the British Medical Journal for the publication in our last issue of the January of The Robinson Index the anonymous Trolley by Surgeon Commander D. Brown, RM. As a result of a misreading/reading we were not aware that the article had already been published in the B.M.J. of 25th September 1963 under the name of New Apparatus.

A further apology is due to Surgeon Lieutenant T. B. G. Carter for a printing error in the announcement of the award to him of the Commander Medal.

### Clinical Find

## A LARGE DENTIGEROUS CYST WITHOUT BONY EXPANSION

By Surgeon Commander EDWARD C. GIBBS, RN

The patient, a male aged 29 years, presented with pain in  $\overline{17}$  region.

**On Examination:** A small mass was noted at the distal margin of  $\overline{17}$  adjacent to a malpositioned. There was no bony expansion and no symptoms, apart from a slight edema.

**X-Ray Examination:** Roentgen films revealed a large radiolucent area involving  $\overline{16}$  region  $\overline{17}$  being unerupted.

**Treatment:** Under aseptic radical anesthesia, a mucous pericardial flap was raised in  $\overline{17}$  region.  $\overline{17}$  were surgically extracted and the cyst lining debrided and bone edges trimmed. A Whitman's Varnish pack was inserted.

**Post-operative treatment:** A week after operation the Whitman's Varnish pack was removed and a previously constructed obturator inserted. At this stage some troublesome hemorrhage was experienced.

The cavity eventually healed satisfactorily and continuously treated in view of the obturator was discarded.

**Pathological Report:** The lining of the cyst is formed of stratified squamous epithelium with chronic inflammation of varying intensity proceeding in total loss of the superficial layers in places. There is nothing specific in the nature of the inflammation and no evidence of neoplasia. There is no area showing characteristic cholesterol crystals, nor clear indication of chronicity.

**Diagnosis:** A chronic dentigerous inflammatory cyst.



complexity. The present is intended to be a simple, complete and, I hope, useful first, or even the only, self description. The one problem is, to the present, no evidence of the final aspect of  $\bar{S}$ .

I am indebted to Sergeant Peter Adams (R. D. Caldwell CB) for pointing it out, and to Sergeant Captain B. Ridgway (RN) for X rays.

## Articles

### THE HEALTH OF THE NAVY IN TWO WORLD WARS

By Surgeon Captain F. F. Ellis, Royal Navy

Consultant in Medicine

and Sir John Newlands,

Consulting Physician to the Royal Navy

Reliable figures for the names of soldiers, seafarers and deaths in a military community show the diseases or injuries of importance and measure success or failure in their control or eradication; they reveal how medical resources are utilized and indicate requirements for research. They provide a key to the past, enable the present to be viewed in perspective and guide thoughts for the future. Although the Royal Navy was the first of the Armed Forces to publish annual Reports of the causes of ill health over a century ago (19), a number thought that today more than twenty years after the Japanese surrendered, so little of historical value has been published concerning the health of the Navy during the two World Wars of the twentieth century.

Reports of the Health of the Navy for the years 1914 and 1915 were published retrospectively in 1920 and 1921 but information on the next three years was fragmentary. After the Great War proposals to prepare reports for the war years from 1914 onwards were deferred on Navy accounts on grounds of economy, and thus it was decided not to proceed with the work. The Medical Officers' Journals and Hospital Misuse Books for 1914 and the following years, were declared to be permanent records which were not to be destroyed, and so were the Registers of Injuries and Deaths, and of Discharges to Ashore. The Official History of the First World War, Committee on Medical Statistics by T. J. Mitchell and G. H. Smith (1931) dealt with non-Navy consultants for the most part in the British Expeditionary Forces, and the only World Medical History of the War includes little statistical material. The first post war Report to be published, was that for the year 1921 after which Reports appeared annually until 1926. They were then in abeyance until 1940 when a Report for the years 1927-1936 was printed as an Admiralty Book of Reference (A.R. 3227).

Between 1926 and 1940 the form and purpose of the Naval Health Reports were considered by a committee of Medical Directors-General of the Navy and Commonwealth, the last of which was the Inter-Services Committee on Medical Documentation which reported towards the end of 1939 (24) (Gen/1508). The current pattern of medical documentation in each of the Services today is based on the recommendations of this Committee. One of us (J.N.) was Chairman of the Naval Medical Directors Committee, appointed by the Board of Admiralty on the advice of the Medical Director-General of the Navy, Surgeon Vice Admiral Sir Madelon Duffley, in 1940 and also accepted all cases admitted to the Royal Hospital, Haslemere, during the years 1927-1932. The other (F.F.E.) compiled the chapter on Naval Medical Statistics in World War II for the Statistical Volume

of the Official Medical History of the Second World War and the First and Second year-wise Reports of the Health of the Navy for the years 1953-1954 (1960) and 1955-1960 (in the press). We are informed by the Editor-in-Chief, Sir Arthur McNealy, that the Statistical Volume for World War II will be the last volume to be published. The Medical Director General (Naval) therefore thought it appropriate that we should review briefly the known facts concerning the health of the Navy during the First and Second World War, and provide, where possible, figures to show the main causes of sickness, injuries and deaths in those conflicts.

We will not attempt to recount the lengthy discussions of the various statistical conventions of recent years. These will be dealt with in the Official History in a section written by Sir W. G. Green, who was associated with the production of all the Reports on the Health of the Navy from 1923 onwards and served on all the statistical committees during and after the war. He also supervised the formidable task of abstracting the causes of sickness from the neurological tables of 70 537 Medical Officers' Journals from which we obtained the figures for the years 1950 to 1960 which are reproduced in Tables 1-4. Most of the subject facts which concern the average medical officer have been summarized in BM 2495 Manual for Royal Naval Medical Officers and in the Journal 6236a (1959).

The only statistical statement which reported during the war and drew fully within the scope of this survey, was the 1945 Committee which submitted its Report in November of that year. This Committee agreed on a survey of medical documentation and statistical procedures in the British Commonwealth and Allied Armed Forces: it focused attention on the Death, Inequality, Suffered and Wounded Registers as the most important statistical documents that the Medical Director-General possessed and made strong recommendations concerning the appointment of an expert with statistical experience to advise the Medical Director-General and to supervise generally the method of analysis to be applied to coming material and the objectives of present and for statistical work.

The speedy implementation of these recommendations resulted in the collation during the war of the data from which the Total Force tables were constructed after the war: the appointment of Surgeon-Commander F. A. Fraser Roberts RNRRC (who later became Civil Consultant in Medical Statistics to the Royal Navy) to the staff of the Medical Director-General and the preparation by him of a report: 'An Analysis of Inequalities due to Disease and Deaths due to Disease 1934-1945' (in which the figures for inequalities in 1945 were added later) which is in the press.

The letter was an Admiralty Book of References (BR 1235) which was at first a restricted document but was later declassified. It was the most significant medical statistical statement prepared since the Report of the Health of the Navy for the year 1936. In the words of Professor Major Greenwood, Consultant in Medical Statistics to the Board of Admiralty at the time and a member of the 1945 Committee: this analysis produced during the war, attained a scientific standard which would justify its publication in the form of any learned society. For the first time the data relating to ratings and officers were examined separately and

the data for women in the *Women's Royal Naval Service* were composed with those for the men. The data were not derived from *Medical Officers' Journals* but from departmental records compiled primarily for statistical purposes. At the same disease and for reasons given later, the analysis did not include epidemics and battle casualties (only diseases for which we show not only the crude rates but also age-adjusted rates for the different age groups of ratings throughout the period of the study—an invaluable contribution which should be consulted by all who require greater information on these matters).

Probably the most significant difference between the statistical tables compiled for the two World Wars and the tables in contemporary annual Reports of the Health of the Navy is that whereas the case numbers in the former were obtained from the figures reported in the *Medical Officers' Journals*<sup>1</sup> those in the latter are compiled from the individual in-patient Record (if Mad) or compiled for every patient who spends more than 48 hours in the sick bay. Thus, the tables in contemporary reports, based on the case record constitute a reliable record (provided such in-patient Record Form is completed for each case on the sick bay or as reported by the regulations). The diagrams on the in-patient Record Form is correct and conforms with the nomenclature of the Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death (World Health Organization) and the diagrams are coded and punched on the Hollerith cards correctly. The tables on reports published prior to 1915 included all cases on the sick list, but were less reliable, because the case numbers in the *Medical Officers' Journals* on which they were based were only as accurate as the accuracy of the medical officer for the number of the Sick Bay Staff responsible for their completion provided.

#### THE TOTAL FORCE

The data which are available for the Total Force during World War I and World War II are summarized in Tables 1 &. The detailed figures for the years 1914 and 1915 are to be found in the *Statistical Reports of the Health of the Navy* published by HM Stationery Office and those for the years 1939-1945 will be published in full in the *Statistical Volume of the Official History of the Service*. It is possible to estimate here only some of the major trends.

With the exception of infectious diseases (venereal diseases, alcoholism, poisoning) and epidemics the table published for 1914, referring to the pattern of previous years, gives the numbers of cases, casualties, deaths and days sickness under the system affected by the disease, but does not indicate the actual diseases causing ill-health (Table 2). The more important diseases or disease groups affecting the different squadrons are, however, shown for 1915, which permits a comparison to be

<sup>1</sup> The instructions for the Completion and Recording of *Medical Officers' Journals*, M. 175 (first issued Form in 1790) state it is a record in respect of all cases entered on the Sick List (M. 175C). A summary of *Medical Officers' Journals* can not be published (but yearly lists of *Complaints from Personnel*, *Wounded or Inflicted* or *Inflicted* Diseases should be sent and written account on the Sick List or *Returning List*).

There are a few exceptions. The venereal registrations require that cases of venereal diseases be sex specific (primary) which are reported on the reporting list only up to the third or 4 days of infection. All swellings and discharges are included although they may, and previously have been on the sick list.

made between the Spaniards for this year and those in the corresponding winter (or summers 1919-1942). A direct comparison is not always possible. For example, the heavy mortality due to typhus in World War I is not reported in World War II but whereas the common cold was a major cause of sickness in World War II (Table 1) this disease was not used frequently in World War I.

The average age (age) and the cases (including) and death rates and the risk daily rate for the Total Force for the years 1914 and 1915 and 1919 to 1945 (including civilians in action) are summarized below together with the rates for these periods (see Table 1911-1916 and 1933).

Year	Average Strength	Rates per 1,000			
		Cases	Daily Death (All ages and Force)	Final Resultings	Deaths
1911	177,198	631	27.1	63.9	3.1
1914	156,308	589	26.3	62.8	3.2*
1915	236,508	664	27.7	63.7	3.3*
1916	182,282	637	28.5	67.7	2.6
1919	131,658	564	29.9	67.7	2.6
1920	279,688	671	29.8	67.8	2.3
1921	366,000	674	28.1	68.9	2.3
1922	316,688	689	27.2	66.1	2.9
1923	479,688	675	27.2	64.0	3.4
1924	702,688	761	27.1	64.3	2.6
1925	773,688	777	26.1	63.9	2.6
1926	178,968	576	23.6	62.7	1.7

\*The death rates from disease only were 2.6 per 1,000 in 1914 and 2.3 per 1,000 in 1915.

When casualty figures are excluded, the case rate in 1915 was less than in 1911. The totals during World War II also compare reasonably with the figures for 1916 and 1925. The daily non-effective rate was appreciably less in 1925 than in 1911 and the figures for World War II were very similar to those for 1926 and 1925. The resulting rate was very much greater in 1925 than in 1911 and a similar but less marked trend could be observed during the first three years of World War III. The high death rates in 1924 and 1925 were due to causes other than wounds in action, for which the rates were 2.6 and 2.3 per 1,000 respectively. The death rate during World War II showed a less marked contrast with the death rates in 1916 and 1925. In the later years of the war, the rate was usually less than double that in 1925 and in the first three years of the war it was less than double the rate for 1916 except in 1919.

The crude rates for the main causes of all health for 1914 and 1925 and for the years 1919 to 1925 are compared in Table 1. Table 1 shows the infectious diseases, for which the health care rate was more than 3 per 1,000 per annum in any of the



years under study and Table 7 shows for which the rate was less than 5 per 1000 per annum. Table 8 shows the diseases or injuries or groups of diseases which caused an increasing rate of more than 1 per 1000 and Table 9 shows which resulted in death rates of more than 0.2 per 1000 per annum. Table 9 shows the 'other' diseases.

Table 6  
CAUSES

Infectious diseases for which the case rate was in excess of 5 per 1000 per annum at any one point

	1914	1915	1916	1917	1918	1919	1920	1921	1922
Cerebral (meningitis)	11.1	6.0	10.1	5.1	4.9	6.2	4.1	1.6	2.7
Diphtheria		3.6	6.6	1.0	7.6	1.1	7.7	1.6	0.1
Scarlet fever		1.7	6.6	2.6	5.1	7.6	4.1	0.6	0.5
Tuberculosis	11.1	26.2	6.6	22.7	12.4	2.7	10.4	4.9	3.7
Cerebral typh		6.6	6.6	6.6	6.6	17.6	6.6	27.5	26.1
Cholera		41.1	0.6	0.1	2.6	0.6	0.7	1.6	1.0
Enter typhoid and dysentery of chronic relapsing character		36.1	7.6	7.6	4.4	7.6	2.1	4.5	0.2
Trachoma		36.7	42.2	26.1	30.1	17.6	76.4	76.7	36.7
Pharyngeal fever	6.1	6.1	0.7	1.1	6.6	6.4	6.4	6.6	6.6
Measles	12.6	6.0	7.6	6.6	6.1	1.0	10.6	7.6	2.1
Diseases caused by infection parasitic and zoonotic		14.2	12.4	23.4	14.6	30.2	22.2	41.4	46.5
Chlamydial and similar	11.2	0.2	5.1	4.7	7.7	2.5	7.6	1.6	0.5
Septic, primary and secondary	69.4	17.6	7.6	6.6	1.1	2.1	1.6	1.6	0.1
Leishmaniasis and trypanosomiasis	62.2	41.2	22.6	22.1	26.6	20.1	12.6	36.4	27.6

††† — or less than 0.25 per 1000

†† — any figure — no information

The numbers for years 1914 and 1915 have been adjusted in one place of decimals to conform with the rates for later years with which they may be compared.

diseases or injuries or disease groups for which the death-rate exceeded 5 per 1000 per annum. Table 6 shows the main causes of lost working time or 'Sick Days' — the non-effective rate.

#### Infectious Diseases

The principal infectious diseases causing mortality in both wars were in order of importance respiratory tract infections, venereal diseases and other infections associated with sexual intercourse, tropical diseases and the infectious fevers (Tables 1 and 2).

The venereal diseases showed an improvement between the wars. Although the rate for chlamydial was greater in 1919 than in 1917 there was a four fold reduction by 1945. The rate for syphilis in 1919 was less than one third of the rate in 1902 and fluctuated around this level throughout the war. The rate for gonorrhoea was on the rise in 1919 than in 1915 and what this there was a steady improvement each year until 1945, by which time a large part of the Naval force was conscripted in the Far East and the Pacific. In considering the infectious associated with sexual intercourse and their non-venereal — which contributed significantly to the other diseases of the urinary and genitoves systems shown in Table 5 — should not be forgotten our venereal control and prophylaxis. The high incidence of the latter in



preventable and very good infection rates met. There were no cases in 1934 only 5 in 1935 but in 1939 there were 18 cases, there were none in 1940 but there were 5 in 1941, 16 in 1942, 41 in 1943, 100 in 1944 and 41 in 1945. The cost of prevention on the other hand included a high annual rate for vaccinal infections (about 100 cases) which required treatment on the sick list in small portions of the total who were fit. The fall in the vaccinal rate during the later years of the war gives some grounds for satisfaction although the rising numbers of cases of smallpox cases can be treated whether this was due to improved techniques or to diminished potency of the vaccine.

The annual rate for pneumonia in the Second World War was about half the rate in 1934 and 1935 and was remarkably constant throughout. The incidence of streptococci in 1939 was almost the same as in 1935 but the rate was halved in 1941 in common with most for the rest of the war.

The rate for pulmonary tuberculosis (Table 2) remained relatively high compared with the rate in the other Services over the years and was rising in the end of World War II, but as Lincoln (1937) observed in his *Men, Moulds and Mice* although the total number of cases reported was increasing up to 1943 the number of new cases diagnosed because the disease was clinically evident fell as a result of the routine X-ray examination of the apparently 650 first litters by nearly half the clinical staff before the war.

Table 2  
CASES OF TUBERCULOSIS

Diseases or groups of diseases or injuries for which the actual rate exceeded 1 per 1000 in any one year

	1934	1935	1936	1937	1938	1939*	1940	1941	1942	1943
Tuberculosis - pulmonary	1.24	1.19	1.0	1.7	2.1	2.4	2.3	2.4	2.4	2.4
Respiratory system	0.8	0.8	0.8	1.1	1.5	1.4	1.3	1.4	1.4	1.4
Septicæmia system	1.2	1.4	0.8	1.4	1.5	1.1	1.0	1.0	1.0	1.0
Conjunctivæ system	0.7	0.8	0.7	1.0	1.1	0.9	0.9	0.9	0.9	0.9
Septicæmia system (excluding respiratory system)	0.6	0.8	0.8	1.0	1.1	0.9	0.9	0.9	0.9	0.9
Septicæmia system (excluding respiratory system)	0.6	0.8	0.8	1.0	1.1	1.1	1.0	1.0	1.0	1.0
Diseases of eye	0.6	0.7	0.6	1.0	1.0	0.9	0.9	0.9	0.9	0.9
Diseases of skin and ear	0.7	0.7	0.7	1.0	1.0	0.7	0.7	0.7	0.7	0.7
Local injuries and lesions	0.7	0.4	0.3	0.7	1.1	0.9	1.0	0.9	0.9	0.9
Total** (all diseases and injuries)	11.7	14.5	12.7	16.0	20.1	18.1	16.2	16.2	16.2	16.2

\* Includes smallpox cases only.

\*\* These figures are totals for cases and injuries for which the annual incidence rate was less than 1 per 1000.

Excluding diseases of blood and blood forming organs, glands and blood which are included under Diseases of the Circulatory System in the Final Census Tables for the years 1939-1943.

The number of cases of TB and smallpox have been reported in one place of documents in connection with the rates for these diseases and are all the same throughout.

The rate for diphtheria in 1939 was one fourth the rate in 1933 and the incidence of the various infectious systems and parasitoses was very greatly reduced. By 1945 however with the concentration of the Fleet in the tropics the case rate for

dysentery was the same as it was in 1915. Dysentery and infectious hepatitis, the latter listed in its distribution, probably caused more serious problems than any other tropical diseases except malaria. Dengue was diagnosed with increasing frequency towards the end of World War II. There were no cases of cholera or yellow fever in 1915 and these infections are not shown in the Total Force tables for 1915-1945.

With the exception of pulmonary tuberculosis, the infectious diseases were not an important cause of disability (Table 3) in either of the wars — the rates usually recovered and returned to duty or occasionally died. The resulting rate for pulmonary tuberculosis was rather greater in 1945 than in 1915 and the 1915 figures did include some non-pulmonary tuberculosis while the 1915-1945 figures did not include but as we have retained the incidence of cases which were diagnosed clinically — as nearly all of them were, in 1915 — was listed in 1945.

Table 4

## 1915-1945

Of cases or groups of diseases or injuries the percentage were reported 0.1 per 1,000 duty days

	1914	1915	1920	1925	1934	1937	1940	1945	1946
<i>Cyrtosporidyl fever</i> (malaria— sexual malarial)	4.6	8.5	~11	11.7				-	
<i>Dysentery</i>	0.2	0.2							
<i>Pharyngitis</i>	0.7	0.5	0.1	0.1	0.1	0.1	-	0.1	0.1
<i>Tuberculosis—pulmonary</i>	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
<i>Dysentery</i>		0.2							
<i>Dysentery—systemic</i>	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1
<i>Cyrtosporidyl fever*</i>	0.1	0.2	0.5	0.4	0.1	0.2	0.2	0.2	0.2
<i>Dysentery of C. F. G. (prevalent recurrent)</i>	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1
<i>Injury—general</i>	4.1	4.4	5.5	1.4	1.1	0.1	0.1	1.4	0.4
<i>General disease including injury and infection</i>		11.7	10.1	10.1	10.2	10.3	10.3	10.1	10.4
<i>Disability and return of infectious—</i>									
<i>Injury—</i>	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
<i>Injury—</i>	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
<i>Total***</i>	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1

*Sampling methods and interpretation*

0.1 = 1 per 1,000 duty days

(1) No report—no information on

(2) No listing of disease of blood and blood forming organs, glandular/organ while are notifiable

Dysentery or Enteritis/Enteritis in the Total Force 1915 to the year 1915

(3) No report—no information on

(4) These figures also include diseases and injuries for which the disease/injury rate was less than

0.1 per 1,000

(5) The rates for the years 1914 and 1915 have been adjusted to one place of decimal to conform with

the rates for later years with which they may be compared

Infectious diseases were an important cause of deaths in World War I but were much less important in World War II (Table 4). The reasons for the death rates for malarial, dengue, malaria, fever, pneumonia and pulmonary tuberculosis

for 1914 and 1915<sup>2</sup> and for 1920 and the subsequent years, provides a useful illustration of medical practice during those years. The combined death rate from pneumonia and influenza in 1914 and 1915 of about 25 per 1,000 would present a formidable prospect for the casual physician of today.

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

The assumed mean rate for diseases reported against the system affected males that against the disease itself are shown together with the rates for injuries and surgery as shown in Table 3. The elements of spread rates affecting any one system are shown in Figures 1 and 2.

1000

Other diseases and injuries for which the cost was less than \$1 per 1,000 per person in any year

[illegible]

\*These calculations are based on the assumption that the average number of children per woman is 2.1.

The values for the years 1914 and 1915 have been adjusted to one place of decimals only. The values for other years are not adjusted.

In both wars local injuries accounted for the largest number of cases in the Total Force usually closely followed by diseases of the digestive system which in most years came third. Local injuries from 1914 onwards. Other dominant groups within a high G.I. incidence were diseases of the genitourinary system and thus the respiratory system, wounds in action. Diseases of the nervous system—often largely pre-war onset, urinary and genitourinary system, skeletal system (cannon of locomotion in World War I and bone-joint diseases during and between World War II), circulatory system and of the ear and nose and the eye.

It is difficult to compare patterns of disease for the two wars. To take one example, the very high case rate of 122.5 per 1000 for diseases of the digestive system in 1915 includes epidemics of the mouth, sore throat, and tonsillitis which are shown in Table 1 with the infectious diseases, not in Table 2. The much lower rates for diseases of the digestive system for the years 1939-1945 in Table 2 do not include the oro-pharyngeal infections.

The total death case rate for all causes of all health (which includes the infectious diseases which are not shown in Table 2) was approximately 160 per 1000 granted in 1915 than in 1939.

Diseases of the nervous system (including mental disorders) caused many casualties thus any other epidemic disease or injuries throughout both wars (Table 3). Pulmonary tuberculosis and diseases of the digestive system were the next most prominent causes. Diseases of the circulatory system were a rather more frequent cause in 1914 and 1915 than in 1939 and 1945. Diseases of the eye accounted for a very high morbidity rate in 1915 due to cases of infections. Otherwise the rates are not remarkable. The highest morbidity rate for all diseases and injuries was reported in 1945 after six years of hostilities when there was less emphasis on the treatment of soldiers following the declaration of peace and the First was still largely concentrated in the Far East and Pacific.

Table 4 shows not unexpectedly that injuries in action were the most common cause of death in both wars except for the years when these figures were not reported and the second most frequent cause was general injuries.

The death rates due to respiratory diseases were higher during the first two years in both wars and so were those due to respiratory diseases (not shown in these tables) when deaths due to pulmonary tuberculosis and pneumonia are excluded. The death rate for digestive diseases was rather greater during the first two years of World War I than in World War II.

#### **Lost Working Days Due to Ill Health**

The total case effective rate — the average sick days per thousand per year (Table 4) — in 1939 were slightly lower than the rate for 1915, a then declined each year until 1945 when there was a slight rise — possibly explainable by the termination of hostilities. During both wars when the rates for syphilis and gonorrhoea are excluded the most prominent causes of time lost on the sick list were: in order of importance, injuries and wounds, diseases of the digestive system, diseases of the genitourinary system and thus, and diseases affecting the respiratory system (all including common cold, influenza and tonsillitis) and the circulatory system.



1,000 per 1,000 total admissions provide a context in the hospital's experience in the two wars and add to knowledge of the distribution of diseases (particularly in 1918-1919) there are otherwise no recent statistical data available so far as we are aware.

This was the largest Naval hospital in both wars and the most clearing station for cases transferred from abroad. The total numbers identified are shown below.

1914-1919		1939-1945	
Total complement = 1,200		Total complement = 1,200 at times reduced to 800	
cases in hospital	1,662	cases in hospital	7,792
1914	11,800	1939	11,000
1915	11,800	1940	11,800
1916	14,700	1941	17,000
1917	14,400	1942	16,000
1918	14,400	1943	14,000
		1944	14,000
		1945	14,000
Total	54,900	Total	71,000

The numbers were considerably greater during the Second War than the First, which is somewhat surprising in view of the lesser—and during the so-called years very much lesser—total complement, but the turnover of cases was greater in World War II because of an effective arrangement for evacuating cases to Emergency Medical Service Hospitals. The cases per thousand admissions for the more prominent groups of diseases and injuries are shown on page opposite.

Space considerations do not permit the inclusion here of the detailed seasonal tables for each of the twelve years covered by the two wars, on which we draw extensively in the ensuing discussion and which will be published eventually in the Statistical Volume of the Official Medical History of World War II.

Whereas the proportion of illnesses designated as common cold and influenza in the Second World War was three times that in the First World War, the figure for influenza in the Second World War was only one seventh of that in the First World War. Gibraltar was not a hospital destination in 1918 in this hospital in contrast with the South Pacific figure for this year (the only year in World War I for which Total Force figures for outbreak are available). A prominent cause for the high influenza figure in the First World War was undoubtedly the epidemic in 1918 during which 1942 cases were admitted. Naval personnel in the Port suffered lightly from influenza in World War II—only in 1944 were there more than 32 admissions—but the admission rate for common cold was always high with a particularly heavy epidemic—1,313 admissions—in 1940.

A notable improvement was to be seen in the relative frequency of dysentery in World War II which was one sixth of that in World War I.

The medical criterion is venereal disease in this hospital during World War II was primarily due to the fact that most of these cases were treated at another hospital in the Portsmouth area.

Finally, the proportion of admissions for tuberculosis and mental illness together were less in World War II than in World War I, but the more serious cases in these categories were treated at the Royal Naval Auxiliary Hospital, Haslemere, near at Haslemere.



	1911-1913	1939-1940
Cholera per 100	0.0	2.6
Cholera (all)	0.0	45.7
Dysentery	23.6	2.6
Typhoid	14	0.2
Paratyphoid	2.8	0.2
Influenza	20.7	1.2
Malaria	4.9	3.3
Mumps	16	2.9
Meningococcal infection	4.7	1.6
Postmenstrual infection (bacteria)	17.6	11.7
Staphylococcal infection	4.0	4.4
Staphylococcal skin lesions	1.4	3.0
Salmonella	19.6	12.6
Tetanus	14.1	42.3
Tuberculosis—pulmonary	10.2	22.2
Tuberculosis—non-pulmonary	2.5	3.8
Chlamydia	11.0	0.0
Syphilis	100	7.2
Gonococcal infection—acute	13.4	7.6
Gonococcal infection—recurrent	11.8	2.3
Neurosyphilis	11.3	0.0
Other venereal diseases (excluding gonorrhoea)	40.9	47.5
Diseases of the heart (organic)	10	15.5
Diseases of the heart (functional)	7.2	4.0
Arteriosclerosis	11.5	31.0
Phlebotomy	30.4	6.1
Splenitis	12.4	12.0
Pyrexia (generic)	3.9	9.7
Pyrexia (functional)	2.1	11.3
Hysteria	20.7	34.0
Diseases of nerves—traumatic	11.3	11.1
Other diseases of the nerves	15.5	18.3
General epilepsy	10.7	112.4
Epilepsy in infancy	30.2	43.4

These figures being proportions of the total admissions, indicate differences in the disease pattern. They should not be confused with incidence rates in the population at risk.

Proportionately two times as many men were admitted with disorders after during World War II as in World War I, partly because specific card examinations which permitted a radiological diagnosis to be made to a number of centres in World War II were not carried out so frequently in the earlier war. It is possible that revised medical standards and cases during the 1940s were corroboratory factors. Some indication of this is given below by the post-war admissions during 1941 when Portsmouth was heavily bombed and in 1945 after the flying bomb attacks and the ravages of blight in the previous year, and this impression is confirmed by the increasing figures for digestive diseases for the Total Force in which we have already drawn attention.

*Pyrexial fever admissions*

<i>Year</i>	<i>Total Cases</i>	<i>Cases after fever</i>	<i>Proportion pyrexial fever</i>	<i>Discharged after fever</i>	<i>Proportion discharged after fever</i>
1918	2,793	34	None	33	None
1919	22,490	194	3	248	3
1921	17,687	184	20	310	15
1922	21,523	87	7	286	2
1925	16,187	117	15	229	13
1926	16,382	166	19	280	26
1929	16,799	223	48	479	24
<i>Total</i>	<i>91,663</i>	<i>887</i>	<i>12.5</i>	<i>1,932</i>	<i>37</i>

Proportionately more patients with diseases of the smaller tonsils and skin were treated at Haslar during World War II than during World War I, the exact ratios this bearing per 1,000 total admissions being as follows:

	1914-1918	1939-1942
<i>Adenoids</i>	7.8	6.4
<i>Scal</i>	2.3	4.8
<i>Erysipels</i>	1.8	6.1
<i>Impetigo</i>	1.5	6.5
<i>Other diseases</i>	17.5	41.2

This may be partly because skin cases were admitted more freely to hospital rather than because of a true increase in skin diseases particularly so the ratio for the Total Force in Table 2 shows that for the groups of diseases the ratios were similar for the years 1914 and 1915 than for any years of the Second World War.

The larger proportion of 'general sepsis' admitted during World War II was due in part to the greater use of intravenous and other forms of motor vehicles, whilst the increased proportion of sepsis in action' were perhaps a natural result of the hospital being at the 'front line' more than it was in World War I.

The table below shows for various other diseases of tropical interest the numbers of admissions to Haslar during World War II with the proportions per 1,000 admissions and the rates per 1,000 strength of the Portsmouth Command (excluding visiting ships).

	1939	1940	1941	1942	1943	1944	1945	Total
<i>Total admissions</i>	1113	1240	1140	1232	1444	1430	1433	11432
<i>No. Died (Male: Female)</i>	11 (7):	20 (12):	14 (12):	40 (14):	14 (11):	30 (24):	20 (14):	154 (92)
<i>Hypertension</i>	26 (20 M): 6 (3 F)	23 (14 M): 9 (5 F)	20 (14 M): 6 (2 F)	11 (8 M): 3 (1 F)	70 (48 M): 22 (12 F)	74 (48 M): 26 (14 F)	31 (14 M): 17 (11 F)	485 (313 M): 172 (101 F)
<i>Coronary or brain ischaemia</i>	8 (12 M): 0 (0 F)	21 (14 M): 7 (5 F)	20 (15 M): 5 (3 F)	34 (24 M): 10 (6 F)	103 (71 M): 32 (21 F)	90 (58 M): 32 (20 F)	106 (61 M): 45 (28 F)	482 (313 M): 169 (101 F)
<i>Arterial ischaemia</i>	1 (1 M): 0 (0 F)	4 (2 M): 2 (2 F)	27 (14 M): 13 (9 F)	66 (31 M): 35 (25 F)	106 (51 M): 55 (35 F)	80 (37 M): 43 (28 F)	12 (5 M): 7 (4 F)	264 (125 M): 139 (91 F)
<i>Obstructive disease</i>	-	4 (2 M): 2 (2 F)	7 (4 M): 3 (3 F)	21 (11 M): 10 (6 F)	70 (38 M): 32 (21 F)	23 (12 M): 11 (7 F)	27 (14 M): 13 (8 F)	144 (75 M): 69 (41 F)
<i>Diagnosis of lymphatic leukaemia</i>	1	1	1	1	1	1		6
<i>Lymphadenoma</i>	1		1	1	1	1	1	6

\*Figures per 1 000 admissions

†Deaths per 1 000 deaths

The rates per 1 000 will underestimate the true incidence since all cases at the Convent were not have been referred to Harlow. They should be regarded rather as indicators of the trend over the years. The average strengths are those given in the Annual Reports of Naval Medical Officers of Health, Portsmouth.

The increasing number of cases of hypertension during the first four years of the war was due primarily to the increasing size of the population at risk.

The increase in 'essential' (or subacute) hypertension and 'arterial' ischaemia during the early years of the war was not, although the latter trend was reversed after 1942 when those responsible for the treatment of syphilis became more aware of the dangers of transmitting the infective agent by contaminated syringes or needles. Evidence has been provided to show that some cases of subacute ischaemia in the Navy may also have been due to 'sympyo-infection' as a result of routine intramuscular penicillin (Ellis 1951, 1955). The admission rates for glandular fever show a similar trend to those for hepatitis.

There were only 13 patients with carcinoma of the bronchus and 15 patients with leukaemia among 11 432 cases admitted to the hospital from a population at risk of 164,392 during the war years, but nearly twice as many were admitted with lymphadenoma.

In summary the types of case treated in the hospital were dictated in several important respects, some examples of which are mentioned above. The conditions under which the work was done were probably more rigorous in the Second World War, particularly during the early years, when the Fleet was under continuous threat of bombardment from the air and all but the most seriously ill patients were

continued to work in the canteen every night while the hospital staff took their usual stations during the early hours of the next day. It was, perhaps, surprising that most of these patients and staff appeared to thrive under this routine.

#### DISCUSSION

During both wars, the figures for casualties and deaths provide the most reliable guide to the health of the Total Force and the absolute writings due to all health free information on hospital experience. The Mortality Reports derived from the Hospital Record are trustworthy while the figures from the Mortality Black Books for World War I provide as far as we are aware, the only evidence concerning the causes of all deaths not only in Hospital practice but for the Navy as a whole during the last three years of that war, apart from the Journal and Registrar which are in store and from which the data relating to more casualties and deaths were never abstracted.

With the exception of wounds and injuries sustained on shore, the Mortality figures in the Ministry's draft for the Official History suggest that the pattern of diseases and injuries did not vary much during the years of the First World War and the distribution of diseases shown by the Mortality Black figures for 1915 is similar to the distribution shown for the Total Force for this year.

Admissions to the sick list and the sick duty, although less reliable, provide the only measures of non-effectiveness due to ill health and the main causes are not the same as the main causes of casualties or of deaths. Morbidity due to minor or non-incapacitating sickness or injuries which did not cause a man to be on the sick list but did cause his attendance as an out-patient, his absence from work or impair the efficiency with which he did his work, was not recorded as a routine concept for that due to venereal diseases.

The practical value of including the 'sickening' as well as the 'sick list' figures as quarterly sources of sickness was provided in World War II by studies of the effects of climate on the health of ships' companies. When the Fleet was concentrated in the Tropics towards the end of 1944 and in 1945 the Commander-in-Chief of the Eastern Fleet and later of the British Pacific Fleet requested information on the monthly incidence on the sickening and sick lists of certain specified illnesses which commonly caused ill health in tropical waters. On the average each month for every 100 men in ships, 29 attended as out-patients and five were placed on the sick list with the condition listed (Elliott 1948). The overall incidence was twice as great as the ships in the more temperate waters where the mean air temperature was, on the average 77°F (25°C) less than the mean air temperatures in the more deadly and this was due largely to skin diseases.

When the war ended, the shipboards of ships were included as monthly sickness returns from all ships in the Navy. The relative sickness incidence in tropical waters was more than double that in temperate waters and diseases of the skin were increased by three to four times (Roberts 1948). The mean air temperatures recorded on the upper deck, each day were then included also. The numbers on the sickening list increased markedly as the average monthly air temperature on

dark at room temperature (20° F (26.7° C) and very markedly when it reached 98° F (31.1° C) (Ellis Smith and Underwood 1931; Smith 1933). Without these clearing test figures the adverse effects of numerous virulent bacteria strains could not have been demonstrated convincingly.

Chemical shortages prohibited the collection of reports on their mortality due to mouse illness in the past but, with the arrival of the compound, this may no longer be the case. If compounds are used for the analysis of health-care-use considerations should be given to incorporating figures for mouse illness as well as mouse illness in the future from shops and establishments, for they will in time provide a more sensitive measure of the effects of environmental stress.

The lowest mortality from infectious diseases in World War II, as contrasted with the figures for World War I, and the associated infections at the most rate and at the working days lost, are self-evident, but even in 1945 there was still room for improvement, especially with regard to respiratory (112) infectious diseases associated with sexual intercourse, skin diseases and protozoan-induced infections whilst pulmonary tuberculosis and psychiatric disease were still the principal causes of mortality.

The reported case incidence for scurvy and beriberi, which had ranged the 19th Century Fleet, was as follows.

	Scurvy		Beriberi	
	Total Force	Deaths	Total Force	Deaths
1914	0	0	0	0
1915	0	1	0	0
1916	0	0	0	0
1917	0	0	0	11
1918	0	0	0	0
Total		1		11
1928	0	0	0	0
1929	10	0	0	0
1931	5	1	5	0
1932	0	0	0	0
1933	1	0	5	0
1934	0	0	0	0
1935	0	0	5	5
Total	15	1	15	5

There was no figure for the Total Force in World War I. But the Medical Museum Book provides that whereas scurvy was reported in only one year (1915), beriberi was not so rare. Only one case of scurvy was reported at Worthy in World War II, and there were no cases of beriberi until 1945 by which time physicians of war

was returning from the Far East but, 28 cases of scurvy were reported in the Journals for 1939 and 1944.

These figures underestimate the true incidence of diseases due to malnutrition amongst Naval personnel in World War II. Page (1944) and Smith, Woodhull and Brown (1951) have reported on their wide prevalence amongst the numerous prisoners of war in Hong Kong, Japan and Malaya and there can be no doubt that although only a minority in Malaya and about 20% in Singapore Captain Page's camp in Japan who came from Hong Kong was in the Navy, many of them suffered from deficiency diseases (Page personal communication), but the majority of these cases occurred early in the War obviously they could not be included in Medical Officers' Journals and so do not appear in the Table above, whilst the figures in the Journals for 1944 were not analysed for the Official History.

When a ship was sunk there was frequently no Medical Officer's Journal. The only notification received by the Admiralty might be a signal from the surviving Naval authority in the area. The official figures for the Navy in the Government White Paper on Conditions in the Armed Forces 1959-1963 (Cmd. 4801: HMSO 1964) were killed 58,155, missing 155, wounded 18,662, prisoners of war 7,401, total 73,643. Thus the more detailed Medical Officers' Journals which did survive reported 25,639 cases due to wounds and injuries in action and 18,463. Probably many of these were not sufficiently serious to be included in reports to the Casualty Section.

The Medical Department's Register of Deaths and due to enemy action does not include the loss of personnel at sea such as the *Arcturion* (HMS Glacéway) and *Arcturion* which were a total loss and where the actual causes of death can never be known. Thus the death rates from injuries in action and submarine attacks in Table 4, which were derived from the Register, are hopelessly inaccurate and deaths due to enemy action are not included after 1940.

All the rates shown in the Tables are crude rates. The crude death rates for disease and injuries during World War II were rather poorer than in 1936 and 1940. However, when the rates for diseases alone were adjusted to allow for the different distributions of age-groups in the peace time and war-time Navies, Frank Roberts demonstrated in HMS 1120 that the apparent increase in deaths due to disease during the war was eliminated. Age-adjustment also modified apparent differences between officers and ratings. This technique is applied nowadays as a matter of routine in the analysis of Naval health reports.

The Annual Health Reports were not published in World War I — even the material for them was not prepared after 1915. Work on the Reports was again broken off in 1938 and there was no further publication until 1963. As a result of the efforts of the Sheldon Inquiry and the 1960 Committee, the situation was partially remedied in World War II, but during the early years the machinery to provide information on wastage and non-effectiveness due to sickness and injuries was working badly. There is a lesson to be learned here. The compilation of health returns should be geared not only to peace-time needs but also to the

requirements in war for ensuring medical/paramedical wastage and new effectiveness and the most useful ways of deploying medical resources and manning potentials.

The considerably labour-intensive way of dealing with a sudden influx of health systems from a greatly swollen war-torn Britain in the past can today be reduced by the use of computers and the possibility of using computers in-house that the essential facts concerning the health of the fighting man can collated automatically and expeditiously in a future war if there should be one is being explored. Whilst such information would of necessity be subject to the appropriate security restrictions in war time it would be desiderable at the termination of hostilities to make informal and unsatisfactory retrospective reviews such as we have attempted here necessary and to put in their place an adequate contemporary statement of the facts.

### SUMMARY

We have examined and commented briefly on the figures which relate to the health of the Navy for the Total Force and admission to the Royal Hospital Haslemere, during the First and Second World wars.

Our observations do not lead themselves to further conclusions.

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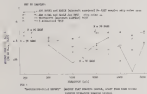
# THE 'BACKGROUND NOISE EFFECT' and AUDITORY THRESHOLD\*

By Surgeon Commander R. R. A. Cole, RPS, and  
Doctor R. J. Knight (Institute of Laryngology and Otology)

## The 'Background-Noise' Effect

In a series of audiometric surveys of personnel serving in a variety of noise-hazardous situations (Cole and Knight, 1965) it was found that those in ships had a depressed hearing level which was not related in exposure to the possible noise hazards under investigation and which was not present in a group of new entry recruits (Knight and Cole, 1966). All the hearing tests had been conducted in good acoustical conditions (ships and a land base verified) and the addition of the underwater test was consistent throughout the investigations.

The depressed hearing level in the shipborne personnel was spread across the full range of audiometric frequencies tested (250 to 8000 c/s) and its magnitude appeared to depend on the level of occupational 'activity' (noise and vibration from machinery systems and human machinery) in the ships concerned. Figure 1 illustrates the findings, which we called the 'background noise effect'.



In temporary nature was well demonstrated in a later audiometric survey involving one and none of 16 naval personnel. Half of the group were selected within 24 hours of leaving their ship (the level of activity in which had increased over the time of the original hearing tests) and the other half were selected after a

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period of four and to twelve months' service active. The first half showed an increase in the background noise effect while the second half showed a complete recovery (Figure 2).

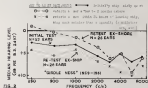


FIG. 2

ALTERATION OF LEVEL OF "BACKGROUND-NOISE EFFECT"  
WITH CHANGE OF R.M.'S LEVEL OF "ACTIVITY"

Similar recovery was found in a follow-up survey of another group of ship-borne personnel (Kearse and Cole, 1945) while in the capital hearing measurements of these men the usual rate of recovery after leaving the quiet of an ashore environment was shown to be fairly rapid (Figure 3).

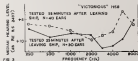
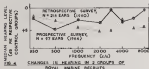


FIG. 3

POSSIBLE EFFECT OF RECOVERY TIME IN "BACKGROUND-NOISE EFFECT"

The same effect is apparent on examination of the results of other studies of the effects of various causes on hearing, for example in test-panel tests (Land-Parsons, 1937) and in aircraft. Somewhat unexpectedly, however, the authors found

a 'masker' effect as Royal Marine recruits under training sailors, before they had been subjected to weapons noise. Later a prospective survey confirmed the finding (Figure 4).



The relative lack of noise exposure during early training in the Royal Marine recruits led to a reconsideration of how long a post vibration might play in causing the background-noise effect. It seemed possible that mechanical vibration whether periodic, random or impulsive might be a cause of the temporary elevation of the threshold of hearing. Indeed at the prospective survey the elevation of threshold tended to be greatest in those coming direct from such vigorous activities as drill and physical training.

The noise levels described, slight from noise hearing level (as in Figures 1 and 4) and changes in level of background noise effect (as in Figures 2 and 3) are in most cases supported by tests of significance. It would not be appropriate in the course of this work to give details of the tests performed, but they are available in the original Royal Naval Personnel Research Committee (Medical Research Council) reports describing the surveys.

#### Vibration as a possible contributing factor

There is some evidence (Kubliavsky, 1963; Torkin, 1965) that workers in intense vibratory environments are liable to minor permanent hearing deficits involving frequencies lower than those usually affected by noise, because of the vibratory system may also vibrate.

Little experimental work has been carried out concerning the effects of continuous vibration on hearing. Moore (1959) exposed his young subjects for measured 30-minute periods to vibration (approximately 0.9 g at 17 s/s) whose noise (100 dB) and to vibration with noise. Auditory thresholds were measured before and after exposure. From vibration alone he found a lowering of threshold and from noise alone a high noise threshold shift (HTS), but from vibration with noise a still greater HTS resulted. These effects were at 4000 s/s. He concluded that vibration alone is not harmful to hearing, but that it is very harmful when accompanied by loud noise.

More recently, Casper and Cude (1965) have completed a similar study. The details of which are given in a later paper. Low frequency TFS of perception type resulted from normal unaided situation (20 d/b, 0.7 g) for 30 minutes. Simultaneously it appeared to give a measure of protection against noise possibly due to changes in middle ear muscle activity.

#### Conclusions regarding otitisology

Low level noise is probably the principal cause of the effect described. Indeed there is some evidence for an effect on hearing by everyday ambient noise. Bryan, Probst and Torgus (1961) have reported significant recovery of hearing at 250, 1000 and 3000 c/s in subjects involved in a quiet room. This was not accountable by apparent improvement in hearing due to practice or habituation.

The findings in the Royal Marine course, the reports of Kallman (1960) and Torkin (1960) and our experimental study all suggest that vibration may sometimes be at least a contributory factor and at some times the main factor. More recently the authors have come to suspect that, perhaps by means of the middle ear muscles, the effect may sometimes be linked with a general increase in muscular tone and physical fitness.

It has been suggested that changes in motivation and associated increase in reduction of effort during submaximal test might explain the effects reported, particularly in the case of the Royal Marine recruits. It is difficult to apply this argument to the day-to-day personnel especially where changes in hearing have been measured whilst in the service. It was noted that in the prospective survey many well succeeding submaximal techniques were used. There was no change in the mean amplitude of the hearing (thresholds about 10 dB) between test and retest. If a reduction in effort to record an accurate threshold had occurred, this would probably have been accompanied by an increase in amplitude of hearing.

#### Practical significance of the background noise effect

(i) It is a factor to be considered in measurement of the normal threshold of hearing. In the surveys mentioned, Ringle and Lohs (1962) used serial methods in line with the Service, at a background level of 30 d/b (observed) average thresholds in close agreement with the British Standard normal threshold, but they used the moving normal sample, one or two relatively noise-free weeks after commencing training. The average normal hearing level would have been less sensitive by about 4 dB. The results of Bryan et al (1961) showing improvement in hearing during the first hour in quiet appear to make the problem of standardization even more difficult. It may therefore be that not only has the noise of 'normal' subjects to be carefully examined but also the quiet environment necessary before measurement of their hearing thresholds should be precisely defined. It is even possible that the difference between the American (1944) and British (1954) Standard normal thresholds of hearing might be partly explained by a difference in background noise exposure of the subjects prior to the hearing tests.

(ii) Sometimes, as in the above personnel, the effect may have importance in measurements of the hearing of subnormals. Changes should be aware of an

accuracy and its possible relevance to interpretation of changes in hearing, appear still in the state of apparent recovery from some induced hearing loss. It would, however, have greater importance whenever routine audiometric measurements of some exposed personnel are carried out (e.g. in monitoring radioactivity). Changes of 3 dB or even 10 dB may well be due solely to a change in the noise general environment. An isolated test discrepancy with small changes would not be significant as they would not be greater than the usual range of variability of threshold measurements (Kubaska 1965) but, as the effect remains throughout the frequency usually tested, identification of a change in hearing due to it should not be too difficult.

(iii) In audiometric surveys one is attempting to measure threshold changes of a group and relate them to some particular auditory hazard. Often the changes are small because one is failing to detect a possible effect which at least has to be looked at as early stage by more rigorous hearing conservation measures. Differences in background noise level in the periods immediately preceding the hearing test and going over therefore either obscure or accentuate real noise induced changes in hearing. This possibility gives further reason for including in audiometric surveys, and especially those concerned with radioactive personnel, a control group of non-noise exposed subjects from the same general environment.

(iv) The effect may often be perceptible in type, although no information is available to show whether an physiological basis is perceptual or mental. If the effect were central, then it might in fact constitute an index of some general depression of cerebral activity. The latter would have considerable importance in relation to working efficiency and provide a useful indicator for keeping noise and vibration levels in ships and aircraft to a minimum.

(v) Can the background noise affect on hearing become permanent? One evidence from personnel with prolonged exposure to ship noise is against such a conclusion, but it is perhaps relevant to observe the difference in onset latency between the older age groups in industrial communities and those in populations who must live in areas of high ambient noise as their way of life (Kilgus et al. 1959). The people of St. Michaels, like the Eskimos, happen provide the same example and their hearing was found to be markedly better (Rosen et al. 1962), more accurately though in old people who had always lived in the quiet of rural Canadian hearing levels were measured which were rather worse than in comparable British samples (Hinchcliffe 1967).

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## A PATTERN OF OBESITY IN THE ROYAL NAVY

By Surgeon-Lieut-Commander T. F. Oliver, RN

### INTRODUCTION

We are all familiar with the overweight tables. From the accurate data of the Life Insurance Companies the tables radiate to the office as well documented Ordnance Classed Instructions and Medical Handbooks tell us to take obesity seriously and lay down limits for our patients. What is not known is the extent of this problem in the Royal Navy, or whether it exists or on what services of the Naval population it is most prevalent?

Edwards, Kemsley and Thompson (1962) in a comparison of the Index of Adiposity considered that the simplest and most satisfactory Index of Adiposity based on height and weight is the ratio of the observed to the standard weight. Both weight and height are easily and accurately measured but 'standard' or 'expected' weight tables vary. Both a table is in use in the Royal Navy.

Most standard weight tables have been composed from American general data but Kemsley, Edwards and Thompson (1962) have suggested a new standard for British men compiled from British Anthropometric Data.

This paper sets out to investigate the extent of obesity in the Royal Navy and to make comparisons between the data and some other British figures.

### THE RN STANDARD

The Handbook of Naval Medical Standards (BR 1385A, 1962) lays down the expected weight for male personnel taking into account their height and their age (see Table 1). These weights are slightly in excess of male weight as they represent weight in uniform. It is expected that 50% of personnel will have a weight within two marks above (22.2%) and one mark below (16.7%) the expected weight (the 95 female). Royal Naval policy also lays down that:

- (a) No candidate may be accepted for entry whose weight varies by more than 25% from the expected weight.
- (b) Veterans of more than 25% in excess personnel should come consideration as to the time a physical fitness and ability to carry out the duties required in carrying P2 &c. For her full use or field service as any part of the world and able to withstand exposure and fatigue for normal periods.

All Naval personnel are weighed and their height measured on entry. A routine low purity PLUMBING at some special medical and no discharge.

### METHODS

The Naval Medical Officer has been given expected weight standard based on height and age all these being easily measurable.

In this pilot survey of obesity in the Royal Navy the following were considered worthy of study —

1. Are a significant proportion of naval personnel outside the limits laid down?





Age was recorded as that of the individual last birthday.

Height was recorded as bare feet to the nearest inch.

The mass, rank or rating was also recorded together with the branch of the service.

#### DATA PROCESSING

Each punchcard was tabulated from each recorded weight (the average weight five stopped rotating by stretching, resulted in being the weight on the line with the 4th).

The Expected Weight for each individual was taken from the standard table for his age and height and a percentage of over or underweight calculated according to the formula:

$$\frac{\text{Actual Weight} - \text{Expected Weight}}{\text{Expected Weight}} \times 100$$

This gave a series of both positive (or overweight) and negative (underweight) readings. These were then grouped in percentages as over 20% overweight, 20% to 24.9% overweight, 15.0% to 20% (underweight) and over 20.0% underweight. In addition those whose weights were outside the expected 95% limits (of 22.5% over and 18.7% underweight) were separately considered. The entire data bases recorded were then grouped as follows:—

Age: In 5 year spans (i.e. 12-16 years, 16-20 years, 20-24 years, 24-29 years, 30-34 years, 35-39 years, 40-44 years and 45-49 years).

Height: In 3 inch spans (i.e. 63-65 inches, 65-67 inches, 67-69 inches, 71-73 inches, 75 inches and over).

Rank or Rating: As Officers, Chief Petty Officers and Petty Officers, Technical Rates (i.e. Artillery and Mechanician (all ratings as Chief Petty Officer) or Petty Officers), Leading Branch, Able and Ordinary Rates, and Juniors under 20.

Branches: As General Engineering, Weapons and Radio Communications, Supply, Medical, Shipwright and Miscellaneous, Distributor Officers, Chaplains and Regulating Staff.

The information was then transferred to Punch Cards. Each card recorded data for factors (and for those outside the 95% limits) a rank factor.

The cards were then processed and tables of the findings produced (Tables 1 and 2). Numbers were reduced to percentages to enable direct comparison to be made between groups.

The sample has a bias in the Supply Branch figures as there were no United Kingdom Cruisers and Riverine survey of the ship and the Hong Kong ratings who filled these posts were not included in the sample.

The high proportion of technical ratings (i.e. R.R. As, O.A., L.A., R.R. As, Main mechanics and Shipwrights) representing 25.7% of the ships company means that the data relating to these personnel is particularly valuable.





## ANALYSIS

The total percentage groups for under and overweight shows a normal skew (vide table four Histogram). The sex and ethnic groups also show a normal skew distribution. There is however a shift to the right or left.

The differences between the females, suggest a preponderance of overweight amongst the shipwrights.

The height groups show little variance from the mean for the whole sample except for those under 60 inches in height.

The females under 16 show a definite trend to underweight.

If the percentages above and below the expected weight are considered the underweights exceed the overweights only amongst under 16s the females under 16 this correlation would be expected and in the 60-69 inches in height (the group contains 71% of under 20's compared with 17.1% in the whole sample).

Applying tests of significance to the findings of the samples the percentage in the samples 11.03% outside the 90% limits laid down in Table 1 is significant ( $P < 0.01$ ).

The age group 15-19 show a significantly different percentage outside 90% limits compared with all the other age groupings ( $P < 0.01$ ).

Tests of significance between ethnic groups show  $P$  to be greater than 0.05.



## Comparison with other British Studies

Kennedy, Bellhouse and Thompson (1961) published a table of suggested standard weights based on British observations. Their standards are compared with the RN standard using the value listed in Table 4.

Hewell (1960) in his Woodhouse study used Kennedy's standards.

The Ship Company study has also been re-classified according to Kennedy's standards and the results are set out in Table 5.

As it would be difficult to separate the Naval personnel into manual or non-manual workers a combined Whitehead percentage has been used using their ratio of manual to non-manual workers i.e. 2 to 3.

A comparison of all three studies is made in Table 6.

Comparison between Grandey *et al.* and the Ship Company study shows a significant difference between each group ( $P < 0.01$ ).

Table 4

Comparison of male weight losses for three studies, as they relate to Royal Naval Band and Group (see legend below Grandey, Bellamy and Thompson)

Age	Height								
	64 ins		67 ins		70 ins		73 ins		
	A. et al.	B. B.	A. et al.	B. B.	A. et al.	B. B.	A. et al.	B. B.	
20-24	118	123	123	132	131	142	144	154	a
	118	126	128	138	133	150	151	162	b
	127	134	138	146	150	158	162	170	c
	140	160	161	176	175	188	188	200	d
25-29	113	124	126	135	136	146	146	157	a
	123	131	134	142	143	154	156	165	b
	133	138	142	148	150	162	167	175	c
	134	154	168	178	181	192	192	200	d
30-34	120	127	130	138	141	148	150	161	a
	128	136	138	145	150	157	161	168	b
	137	141	140	143	148	161	172	177	c
	140	160	174	181	185	196	200	211	d
35-39	120	130	131	141	141	152	150	163	a
	131	137	138	148	150	160	163	172	b
	141	144	148	155	158	168	172	181	c
	140	173	174	183	185	200	200	213	d
40-44	123	131	136	147	148	154	156	168	a
	133	139	144	150	153	162	166	175	b
	143	146	153	160	163	178	177	185	c
	150	174	180	184	184	200	200	218	d
45-49	125	134	136	145	146	157	156	168	a
	135	141	144	153	153	161	160	170	b
	142	146	153	161	163	171	171	182	c
	155	176	180	181	184	200	200	220	d

- notes: a Lower half desirable weight (57%, underweight)  
 b Desirable weight  
 c Upper limit (desirable weight) (57%, overweight)  
 d Lower limit (57%, overweight)

Table 5

Distribution of ship company weights (percentages)  
(using Table 4 after Kennedy, Bellows and Thompson)

Age	Below desirable weight	Desirable weight	Above desirable weight—25%, overweight	Over 25%, overweight	Fourth
20-24	4.2 (1)	41.2 (44)	44.9 (50)	14.7 (16)	19.4 (17)
25-29	9.7 (11)	34.6 (40)	34.2 (39)	17.5 (20)	59.1 (114)
30-34	7.3 (4)	35.8 (27)	43.7 (26)	18.2 (19)	18.9 (35)
35-39	4.7 (7)	32.3 (7)	58 (29)	10 (5)	8.8 (20)
40-44	7.2 (1)	21.3 (1)	57.2 (8)	14.3 (2)	4.3 (14)
45-49	10.3 (1)		67.7 (2)		9 (7)
Totals	7.8 (15)	33.4 (115)	43.2 (244)	11.6 (54)	100 (1405)

The figures in brackets represent actual numbers.

Table 6

Comparison of Ship Company, Kennedy et al., and Howell Study (percentages)

	Below desirable weight	Desirable weight	Above desirable weight—25%, overweight	Over 25%, overweight
Ship Company	7.8	33.4	43.2	15.6
Kennedy et al.	21	50	29	
Howell	13.67	67.16		19.17

Comparison between Howell's and the Ship Company study showed significant differences (P<.05) except in the over 25% overweight groups.

## DISCUSSION

All the personnel in the sample were rated 52 at the time of measurement. If, however, they had been candidates for entry to the Service 29 (24%), would have been rejected on grounds of obesity since 25 = 1 overweight. These comprised 4 officers, 6 seamen/1 crew, 3 Petty Officers and 15 junior rates. Applying the weight standard suggested by Remaley, Billewicz and Thompson (1962) 34 would have been rejected.

McNair (1961) and Powell, Corrigan and Stoddard (1962) have both drawn attention to the dangers of overweight in Naval aviators. Roberts, Mann, Jones, James and Callaghan (1963) have compared physiological measurements in a series of both obese Royal Canadian Navy personnel and controls. Howell (1964) found no correlation between sickness absence and obesity in his Winkfield study.

From this study it would be impossible to ascertain whether the mortality and/or morbidity for diseases known to be associated with obesity is greater in this sample than would be expected.

It is interesting to note that no section of the naval population produces a significantly greater proportion of obese or underweight personnel except in relation to retirement groupings of length and age.

The results related to the previous paragraphs may well be worthy of study to particularise the overweight, obese/overfat and the underweight persons.

Of general interest is the lack of obesity in the under 45 in both groups (although the only obese man in that group in this sample was a Petty Officer and the most overweight man in the ship (58%).

The ages of 30 to 44 show the largest shift towards obesity and is similar to the experience of Howell (1964) although his percentages were based on age group of 25 to 34.

Amongst seamen the above symptoms being noted leads as a sample it is likely that most or all apply to the Royal Navy as a whole. It is probable that some 1 to 10% might only be accepted by Life Insurance Companies as below average risks. We already know that tropical conditions do not favour the obese part of the five ratings excluded from the ship during my 11 year appointment, most were 21% over or under weight. Six of the obese 29 were regular members of the ship's sports teams. One half the ship's time was spent in the hot, humid atmosphere of Singapore and most of the Officers or junior ratings accommodation was air conditioned.

The comparison with other studies is illuminating. Using Remaley et al's table there are significantly less underweight personnel than would be expected, while the proportion of the grossly obese compares almost exactly with the Winkfield study.

Remaley et al's suggested standards reduce the number of underweight persons not over 20 years of age to a very small proportion.

It could be considered that the Naval weight standards are unrealistic, but a man who is expected to weigh 151 lb can vary from 129 to 182 lb and still remain within the 95% limits. To allow high weights as standard would only result in

men) personnel being classified outside the breast light and fat outside the upper

limbs (see Kennedy *et al.*) a suggested standard would have the reverse effect.

Suggested remedies for the present situation are outside the scope of this paper. We could easily make a table of obesity, but nevertheless some of the personnel in this sample would undoubtedly benefit from a reduction in weight.

#### SUMMARY

The body weights of a ship's company of 417 have been measured and analyzed.

A significantly greater proportion were outside the 95% limits of mean and underweight had been for the Royal Navy.

A significantly greater proportion of the over 20's were outside these limits when compared with the under 20's.

British standards have been noted and include the obesity of Singapore, and the underweight of the under 15's.

Application of entry standards to these personnel would have resulted in the rejection of 79 (19%) for the Naval Service.

Comparison with two other British studies shows significant differences.

#### ACKNOWLEDGEMENTS

I acknowledge the permission of The Medical Director-General (Naval) to publish Table 1.

My thanks are due to Captain R. L. Endersby, RSC, RN, and the ship's company of HMS *Northland* without whose co-operation this paper could not be written, and to Ruth North-Pelly, Officer W. Page and my staff on the ship for their help and interest.

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The authors of the new paper have taken a further step and applied technical skill to produce another Master from their photographs to give all at the benefit of a last refinement. This time it is obvious that virtually a combination of three good photographs is required to produce a single Master, and it is not surprising to find that the authors have taken the trouble to make a comparison of the three original photographs with the Master. The authors also state that the Master is a composite of three photographs, and that the original photographs are not identical. This is the obvious result of the authors' desire to produce a Master from three photographs, and it is not surprising to find that the authors have taken the trouble to make a comparison of the three original photographs with the Master. The authors also state that the Master is a composite of three photographs, and that the original photographs are not identical. This is the obvious result of the authors' desire to produce a Master from three photographs, and it is not surprising to find that the authors have taken the trouble to make a comparison of the three original photographs with the Master.

This work is already designed for the future pedagogical and technical and will be extended (project 14). Some supporting text, training and video-illustrative presenters are made up to train the future support opportunities. In practice, we find that it is already not as the appearance of only a few, but having a similar appearance (which is not really in place) applied. I say it for the first time of the authors that there is little to spend with in the process, they have published and they are in, very close to being together in the future, as when you.

The three photographs of previous projects in blood labs are provided by four stages of cellular changes in different persons throughout the same same when they have arrived at home. Compared to these photographs and use the colour changes of the skin at both these moments, I would like to have one photograph taken by the observation of patients' skin in light from the stomach, stomach contents and the colour of the skin in the stomach in different and unexpected spatial distances. Key to it is the type of difference in the environment (change in time and space).

Measure targets are shown in a few paragraphs for illustrative purposes and some may not appear in the final plan. Addressing all state law provisions would require the state to act on the issues.

Incidentally, this theory, hypothetical as it may be, is very disappointing in that it fails to tell us how we have our numbers in the first place. It is a pity that this is a polyphasic theory like a postmodernism, to 10% of us, this beautiful picture could not be viewed as a natural flow for all of them.

The hospital took well to its hospital place as indicated for many years. It is a well-known fact.

**Source:** *Wells*. Edited by Helen A. Mayland. Pp. ix + 114. Edinburgh and London: J. A. S. Hutchinson Ltd. Price 10s. 6d. net.

Mr. Thompson has written a fascinating biography of some of the most colorful medical practitioners of the Nineteenth Century, which should have found a second or a third medical edition, and it is almost a pity to find it so long in the Great West. It might be suggested in regard to the present of the service as being somewhat lacking to the community, and that the great medical edition under a new physician's collection.

[illegible]

The "Shagbark" is noted for its hardy and flexible bark and is more hardy than the more common "American" species. The bark is covered with a thick layer of cork, which is very hard and is not easily penetrated by insects. The bark is also very hard and is not easily penetrated by insects. The bark is also very hard and is not easily penetrated by insects.



concerns a different community, in the contemporary context of the 1960s, and is thus more relevant to the present than the historical perspective of the book.

The authors are concerned to present a detailed description of the social and cultural life of the people. The general perspective is that of the anthropologist, but the book is written in a style which is accessible to a wider audience. The book is a valuable addition to the literature on the people of the region.

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**5. TAYLOR, H. M. *The People of the Region*. (Oxford, Clarendon Press, 1965. Pp. 128. 5s. 6d.)**

This book is a study of the people of the region. It is a well-written and accessible book which will be of interest to a wide range of readers. The book is a valuable addition to the literature on the people of the region.

All but one of the twenty-two chapters, are directly concerned with the people and their life. The book is a well-written and accessible book which will be of interest to a wide range of readers. The book is a valuable addition to the literature on the people of the region.

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This book is suitable for undergraduates and it is possible to use it as a text for a course in the 7 signal frame pattern of a second module and perhaps even cover the entire book. It is available in paperback and the price is £10.00. The paperback is available from the publisher, John Wiley & Sons, Ltd, 605 Third Avenue, New York, NY 10158, USA. The hardcover is available from the publisher, John Wiley & Sons, Ltd, 100 Brook Hill Drive, Elmsford, NY 10523, USA. The price of the hardcover is £15.00.

[illegible]

We welcome the health status of the shared textbook of Marked Twain, which appears only two years after its publication. It is the longest volume that has, by far, a history of its authors, and two times the length of the other two books.

1. A. Shapovalov, who has already written the volume on the influence of the Russian Revolution on the E. C. Culture, on the East Asian and Third and Fourth World, is in Asia, publishing. Represents the large economic and administrative and the small economic on the market of goods. - Represents the 2nd volume of the series on the history of the development of the world, which will be published by the publisher, published by the E. C. Culture.

It does nothing else, when nothing remains to be done, and nothing more than prepare to meet the future with dignity and practical sense. It gives all attempts and has a certain dignity and grace. (141)

His collaboration with Houder resulted in the following publications:

[illegible]





# RECORD QUALIFICATIONS

Navagra Commander A. P. M. Scott (1940-1941)  
 Navagra Commander J. H. Carson (1941)  
 Navagra Commander J. H. Ray (1941)  
 Navagra 1st Lieutenant R. P. B. Lantry (1941)  
 Navagra 1st Lieutenant P. C. Finkler (1941)  
 Navagra 1st Lieutenant R. J. Moxley (1941)  
 Navagra 1st Lieutenant J. R. White (1941)  
 Navagra 1st Lieutenant M. J. Mann (1941)  
 Navagra 1st Lieutenant W. R. Tully (1941)  
 The Captain, Main Mail (1941) has been awarded his work in photographing information in the Royal Navy.

# PROCEEDINGS

To Navagra Vice Admiral J. D. Finkler (1941)  
 To Navagra Rear Admiral J. P. Scott (1941)  
 To Navagra 1st Lieutenant J. H. Ray (1941)  
 To Navagra 1st Lieutenant J. H. Ray (1941)  
 To Navagra 1st Lieutenant J. H. Ray (1941)  
 To Navagra 1st Lieutenant J. H. Ray (1941)

For record of proceedings for proceedings in date 1941.

To Navagra Captain A. J. L. Scott (1941)  
 To Navagra 1st Lieutenant J. H. Ray (1941)  
 To Navagra 1st Lieutenant J. H. Ray (1941)  
 To Navagra 1st Lieutenant J. H. Ray (1941)

# NEW ENTERIES

Navagra 1st Lieutenant J. H. Ray (1941)  
 Navagra 1st Lieutenant J. H. Ray (1941)

# PRE-RECORDATION ENTERIES

Navagra 1st Lieutenant J. H. Ray (1941)  
 Navagra 1st Lieutenant J. H. Ray (1941)  
 Navagra 1st Lieutenant J. H. Ray (1941)

# REMOVED

Navagra 1st Lieutenant J. H. Ray (1941)

# TRANSFERRED TO THE PERMANENT LIST

Navagra 1st Lieutenant J. H. Ray (1941)  
 Navagra 1st Lieutenant J. H. Ray (1941)

# REMOVED

Navagra 1st Lieutenant J. H. Ray (1941)  
 Navagra 1st Lieutenant J. H. Ray (1941)  
 Navagra 1st Lieutenant J. H. Ray (1941)

# RELEASED ON COMPLETION OF SHORT SERVICE COMMISSION

Navagra 1st Lieutenant J. H. Ray (1941)  
 Navagra 1st Lieutenant J. H. Ray (1941)  
 Navagra 1st Lieutenant J. H. Ray (1941)

# CIVILIAN APPOINTMENT ON RELEASED FROM OFFICIAL AND OFFICIAL OFFICER

Navagra 1st Lieutenant J. H. Ray (1941)  
 Navagra 1st Lieutenant J. H. Ray (1941)  
 Navagra 1st Lieutenant J. H. Ray (1941)



# Journal

of the

## Royal Naval Medical Service

PUBLISHED THREE TIMES A YEAR

(The *Medical and Defence Staff* does not accept responsibility for the opinions expressed in this Journal)

Language	54
Disposal of Old Medical Journals	56
Clinical Cases	

Two cases of Retained Menstrua. Intra-Uterine Foreign Body. By Surgeon Captain J. A. N. LLOYD, MC, MCN, MRCN, 1887-1935 Royal Navy

57

The Management of Diaphragmatic Hernia and Associated Lesions Treated by Parenteral Nutrition. By Surgeon Commander A. W. DODD, MC, MCN, MCN (Sigs) Royal Navy

60

Aggressive Psychopathy. By Lieutenant Lieutenant-Commander D. H. MOUNT, MC, MCN, MCN, 1887-1935 Royal Navy

71

### Articles

Medicine and Sport. By Surgeon Captain S. MILNE, MC, MCN, MCN, 1887-1935 Royal Navy

76

Auditory Deafness Accompanied with loss of the Air-Transfer Dental Drill. By Surgeon Commanders (D) A. F. J. SMITH, MC, MCN, and Surgeon Commander E. R. A. CHILL, MC, MCN, 1887-1935 Royal Navy

80

Acute Ulcerative Gangrene of the Vagina Type. By Surgeon Lieutenant-Commander (D) M. N. NAYLOR, MC, MCN, 1887-1935

84

A Six-Year Prospective Study of the Effect of Jet Aircraft Noise on Hearing. By Doctor J. J. EMMETT, MC, and Surgeon-Commander E. R. A. CHILL, MC, MCN, 1887-1935 Royal Navy

92

The Royal Navy Medical Club During 1944

95

### Reviews

100

### Notes of the Service

Obituary: Bentley Watson: Higher Qualifications: Promotions: Personnel Selections for promotion to July 31st December 1944: New Entries: For Appointment: Entries Transferred to Permanent List: Retirements: Withdrawals: GARRING

110

### Editorial Committee

Surgeon Captain S. MILNE, MC

Surgeon Captain (D) D. H. MOUNT, MC, MCN

Mr. J. E. RICHMOND

### #Editorial

The responsibility of writing an Editorial is always a heavy one. Stepping from dull, formal commentaries to an invitation for readers to take up the challenge. The last year's Editorial has indeed achieved this and it gives us great pleasure to publish the following letter which recently drifted up Whaler Creek as a "Gas bottle from a reader whom now the editor suggests he may let a former colleague read about, now a relatively new & distant friend).

"Sir

I liked your Spring Editorial. Such things up a lot.

Regarding "Ghosts at the Top" the race to which you refer was a "walk over" I repeat. So a "walkover". Why you, young fellow talk about paths of justice and such platitudes affects me. Thus we can only reflect further troubled thinking which I can assure you would not have been presented in my day.

Let me tell you Sir that on the Chikung the winner was "sapped" more than 12 months before the weights were published and odds of 2/1 on were freely offered and accepted.

As I said a few months ago to the young doctors of RUMA and PROTECTION passing through "You mark my words young Collier" when this is a matter of history. Being my parents they respected my opinion and quite rightly so. I would have advised them about their own rising prospects but my wife (as Q.A.R.N.S.I) rather readily interrupted with some women's trouble about the "Duke" and who would be the next Emperor in China. Never took a filly Sir Field?

I topped Best Hand in the Ashburton in 31 Ingby Markings on Derby Yearling Club in '31 and Cohen on Alexander's Union Bar in '32. Years before they had even run a foal. All easy winners Sir. The late Humphrey Kemp those wouldn't take my advice. Put a packet on Barkandja who never came under Master's Chisel. Poor Kemphorne was lost on Chiryleba" in '33 after collecting his D.M. & D.D. (Kemp) in 6 months and on diamond courses about Lady Laura in three days Sir.

As Frankly Gaydon (the officer, Sir) said when Percy Nubels left the field standing in '37 "Only a stayer stands a chance" and he was right. In 1940 in 36 Gaydon gave his Commanding Officer's Standing Orders into Grand Harbour on the ground that no problems could be created in said harbor area. He died in '44 leaving a big gap in sporting circles.

In the recent minor event, I also find young Dudley Gurd "sapped" as long ago as "Mines" in '39. Pella's got shrewd. Now there was a show Sir. Well at a cack head and reminded the son. Did we gamble? God no!

In the same event, you mention Bradbury. About 150 out of touch men. I distinctly remember Bradbury taking over Marlin from Crosser in '60 and jolly glad we were. Got a D&O and shot at the thigh, at Gailgole in '63. Damn it, Sir, Sir can't be taking over Marlin again, early. Check on this. He was being in 1955.

In the same event, I see young Frank Ellis says M.D.C. ought to work, not Naval Medical Statistics by computer. You see, there are also you. There isn't what it all really says for them. No initiative. Pretty in the old stuff. Sir, I remember, on the first day of Goodwood. 49 we had losses of 1. Quentons in the house the same afternoon. Did we prove? Certainly not. We wrote down M.D.C. 1/phone number and attributed from it the number of dogs running at Hestrop the night before. 64 lost 64 (including reserves) equalled 64. And that's why there was an outbreak of venereal disease in the W.R.N.S. in 1918. World War I.

When I look over in Singapore another veterinary disappointed overnight. There was just as much for both of us!

The spirit isn't the same, Sir, and how can it be without them? We want things, Sir, and plenty of 'em. And discipline too, and compulsory church after Sunday Services. We need these essentials before the Third World War starts, which it will with these things getting things up such a pace and heading out Marling, Alderwood and what have you. When the time comes, let's get Quentons back with a flock of experienced retired Medical Officers who know how things should be run. Then, and only then shall we get things happening, the same as we did last time.

I hope this helps. I am etc. "Influenced"

Editor, Club, American Island, South Atlantic Ocean.

P.S. Up stream and down stream I say, before things get further out of hand!

This cheerful assurance is doubly welcome as we are publishing an article on "Sports Medicine" in writing which the author completely overlooked the "Sport of Kings" as readily followed by many members of our Branch. "Influenced" comments all this and, but let him be put right in his belief that his successors today look up of the line and spirit of their predecessors. True at the moment, the Branch is overwhelmed with compulsory rudimentary exercises, push and sprays and a whole mechanical system of custom, awards, paraphernalia which is reducing doctors away from basically business and leadership better. Nevertheless, that to Nature's pattern the production will bring and the future production of medical officers will find that their daily work, even diagnosis and treatment, will be done by machines and more they will be free to indulge and enjoy the way of life which their foundation found so elegant. The stress will be broken and the river run with greater vigour. The wine will have broken mostly in the popping cork and rhythm to the reason goes from and content will be added to the joy. It is sad to see the old folk looking back when we are still with our science and forward looking forward. The shape of things to come may change but not the shape of things we love.

## DISPOSAL OF OLD MEDICAL JOURNALS

### Back Numbers of the Journal of the Royal Naval Medical Service

There is a continuous demand for back numbers of the Journal in particular the following numbers

Issue No. 1 Winter, 1962

Issue No. 1 and 2, Winter and Spring, 1963

Issue No. 1 Spring 1965

Subscribers would be doing us a great favour if they would return to the Editor any back numbers they can spare

The following appeal from the British Supporting Group of the World Medical Association has been received from their Chairman, Doctor T. A. Tureball

"The British Supporting Group of the World Medical Association has for the last five years been sending United Kingdom medical journals (British Medical Journal, Lancet, Practitioner) and the occasional specialist journal to doctors in India and Pakistan. This is to support one of the important objectives of the World Medical Association which is to improve medical education throughout the world and to complete postgraduate education in the developing countries.

We are supported by the British Council and the Chairman Committee of the British Medical Association in this venture - the Council subsidizing £250 per year. At the suggestion of the British Council we are investigating the possibility of extending this venture to cover certain countries in Africa. The British Council feel as we do ourselves, that this is an admirable way of helping British medicine along in the developing countries. As your readers will be aware the United States and the Commonwealth Book are sending very large numbers of text books and journals in the English language to these countries and there is therefore a real danger for British medicine to be forgotten by many doctors in these countries.

The British Supporting Group is anxious to support this African scheme and despite the fact that we have some 150 doctors in this country reading these Journals in India and Pakistan, we shall require further copies of the Journals mentioned above to implement the scheme.

I am therefore writing to ask your readers if they will donate their medical journals to the African scheme. The British Supporting Group will provide the necessary addressed wrappers and envelopes and will pay for the one way postage value of course, the donor will pay the postage itself - this would naturally fit in of great value as we run on a very tight financial schedule.

Would those of your readers who would be interested to help please write to the Honorary Secretary of the British Supporting Group of the World Medical Association

H. W. Fraser Esq. P.O. Box 1008  
1 Brady Lodge Way  
Northwood  
Middlesex

## Clinical Cases

TWO CASES OF  
RETAINED METALLIC INTRA-OCULAR FOREIGN BODY

By Surgeon Captain J. A. N. Lusk, R.N.

## Case 1. J.T. aged 31 years.

Admitted to hospital on 17th May, 1929 complaining of gradual loss of vision over the preceding month.

Seven years prior to admission and before joining the Royal Navy he "got something in his left eye" whilst using a hammer and chisel. The accident caused him pinching himself and he did not consult a doctor.

He was found to have a small radio-opaque area in the lower body (Fig. 1) and a very extensive vitreous detachment with a part last extending almost entirely round the temporal half of the globe.

The intra-ocular foreign body proved to be magnetic, and was removed by the posterior route with a great magnet.

Operations diathermy and lenticular scleral resection were unsuccessful in obtaining a cure of the retinal detachment.

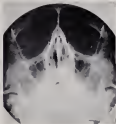


FIGURE 1

He was availed from the Royal Navy on 15th July 1959 with a good left eye, only local movements in the temporal field only.

**Case 2.** P.L. aged 35 years

This man was seen as an out patient at the Royal Naval Hospital Plymouth on the 26th January 1966 complaining of difficulty in reading small print. He had no other ocular symptoms.

**On examination:** R.V. was 6/3 and refraction  $-2.0$  sph gave 6/3 and N6

Muscle balance: normal

Convergence: good

Media: clear

Fundus examination showed a piggy white mass protruding forward into the vitreous from the medial border of the (R) optic disc. The retinal vessels passed through and emerged from the mass (Fig. 2).

Scrutiny of his medical documents showed that in January 1947 he was admitted to the Sick Quarters of the establishment in which he was serving following a lacerant and closed injury. Intra ocular foreign body was not suspected and he was discharged to duty after 3 weeks with a diagnosis of traumatic retinal haemorrhage.

A biopsy of the (R) retina revealed an intra ocular foreign body (Fig. 3) and this was also seen on re-examination of a series X Ray taken 5 years ago in 1961.

As there is no other history of ocular injury it must be assumed that this foreign body had remained in the (R) eye for 19 years.



Fig. 2.





Figure 1

He was referred to the Civil Consultant in Ophthalmology, who agreed that at this stage no further measures were indicated.

As it is felt that the intra-ocular foreign body must be firmly encapsulated by the organized haemorrhage he has been allowed to continue his duties as an unretarded medical category.

Cases similar to both the above are mentioned in Deane Elder's textbook of Ophthalmology, Vol. VI and these are recorded not because of their novelty but as examples of continuing late effects of metallic intra-ocular foreign bodies and as a reminder of the necessity to keep this possibility in mind in regard to this type of injury.

#### REFERENCE

Deane Elder's textbook of Ophthalmology, Vol. VI, 1944, Henry Kimpton, London.

## THE MANAGEMENT OF DUODENAL FISTULA AND ANASTOMOTIC LEAK TREATED BY PARENTERAL NUTRITION\*

By Surgeon Commander A. H. Tonks, RN

Gastric resection involving a gastrojejunostomy anastomosis and closure of the duodenal stump, such as that performed in the Finlay type gastrectomy, carries potential dangers of leakage at both sites and with leakage occurring nearly 50 per cent of the mortality lies in the post-operative period.

Archi and Ellis (1954) described 15 cases of leakage from duodenal staple closure and five from suture closure in 421 cases, giving an overall incidence of 3.1 per cent. Two of these cases died from peritonitis representing a mortality of 22 per cent.

It is of interest that the survival time in these early duodenal cases which, for one reason or another did not undergo a second operation, was 2.5 days and at autopsy a general peritonitis was present.

In the remaining ten cases, the diagnosis was made late and there were only three survivors. Of these three, two were surgically drained and one developed a spontaneous biliary fistula.

Stewart (1963) in his analysis of 79 cases of post-gastrojejunostomy complications recorded two deaths: one survival from a leaking duodenal stump and one case of an anastomotic leak which also survived. This represents a mortality rate of 2.5 per cent.

It is clear that a drain should be placed down to the site of a duodenal stump or anastomosis if doubts exist regarding security of the union later. This will allow duodenal contents to run via a track through the anterior abdominal wall if leakage occurs at the duodenal stump as well as encouraging the track to seal off from the general peritoneal cavity.

It is in these cases where such drainage has not been provided that potential peritonitis develops and the patient will succumb rapidly.

Relief of the duodenal stasis may occur at any time between the first and eighth day although much later leakage have been recorded.

Death may well occur in such a case from dehydration and electrolyte imbalance as a result of profuse loss of biliary and pancreatic secretions. Severe hypoproteinaemia may also occur with all the secondary effects of liver failure, wasting of the patient and delayed healing complicated by secondary infection of the exposed anterior abdominal wall.

The logical management of these cases must be an continuous gastric suction, vigorous fluid and electrolyte replacement supplemented if necessary by blood transfusion to maintain a normal haemoglobin, protection of the exposed abdominal wall and the administration of antibiotics.

\* Paper read at a Symposium on Postoperative Care, The Royal Society of Medicine, 17th October, 1962. Sponsored by Parnell & Hyatt Ltd. Manufacturers of Intestinal and Stomach

This regime will support the patient long enough to allow spontaneous closure of the fistula which may be expected to occur in 10 to 14 days in the absence of obstruction.

There are, however, cases where an established fistula may persist for much longer. Such patients may suffer pulmonary complications or malnutrition: poor diastolic or pulse pressure which are the body's response producing profound malnutrition, anorexia and even ankylosed stomach. While the dietologist and surgery expert can be encouraged by normal intake and drainage when with the correct proportions of potassium chloride added few calories and little or no protein are provided in this regime and thus the body's own proteins continue to be metabolized without replacement.

The advantages of high caloric parenteral feeding thus become obvious and contraindications for oral intake such as the form of fistula and associated respiratory provide maximal caloric intake for metabolism within the accepted limits for normal food replacement. The case that follows demonstrates the value of such replacement nutrients in a patient whose fistula persisted for six months.

#### CASE REPORT

The patient, a 37 years old male patient, was admitted to hospital in March 1964 with a ten year history of dyspepsia occurred sporadic pain vomiting, no fever and an intake of 15 per cent (40 g per cent).

His past history revealed that he had been first investigated for his complaint in 1952 when a barium meal failed to show any abnormality.

He continued to experience small episodes of dyspepsia responding to self administered antacids until a severe exacerbation of his symptoms led to a further barium meal in 1962. This revealed a small loose ulcer ulcer which closely healed under strict medical regime.

A further relapse of symptoms developed in 1964 but barium studies were normal except for dyspepsia only. He was again treated by antacids and antacids with improvement until the recent onset of dyspepsia which led to his admission because of anorexia.

The anorexia was corrected by blood transfusion and thereafter he was fully investigated.

Barium meal revealed an irregularity of the pylorus due to a small ulcer as well as a further ulcer on the left border of the posterior wall of the duodenum.

An esophageal manometry test showed a low resting tone of 0.4 in esophageal region only no (7) in esophageal manometry.

All other investigations including electrolytes blood urea, B.C.G. were normal.

The patient was referred for surgical opinion and gastroscopy was advised after consultation.

At gastroscopy was made later from varying and discomfort were present around the pylorus, upon together with exposure of the ulcer border of the first part of the duodenum. There was a considerable number of adhesions to the lesser sac and between the duodenum and gall bladder.

An intestinal Polya jejunostomy was performed with an anastomosis jejunum to jejunum. Duodenal stoma proved difficult but was finally accomplished in two stages, burying the stoma with non-absorbable sutures into the bend of the jejunum.

The abdomen was closed with a drain down to the duodenal stoma.

Post-operatively he was maintained on gastric suction and nasogastric therapy. Twenty-four hours after operation his condition was satisfactory; haemoglobin estimation was 100 per cent (12.1 g) with a P.C.V. of 47.

Forty-eight hours after operation profuse bloody drainage occurred through the drain to the duodenal stoma although the patient's general condition remained good.

Blood-stain estimation revealed lowered haemoglobin sodium and serum potassium but normal chloride and potassium and was corrected by appropriate electrolyte and blood replacement once the haemoglobin was observed to have fallen to 11.5 g per cent.

On the 4th post-operative day the patient was obviously ill with persistent tachycardia and a tender distended abdomen with bilateral flank distension. The bloody drainage had continued unabated.

X-ray of the abdomen revealed a large collection of peritoneal fluid and the rectal stool bowel.

A drainage, paracentesis produced 800 ml of pus from the left flank and 100 ml of altered blood from the right flank.

Laparotomy was undertaken the same day revealing a large abscess extending from the left subcostal region into the left paracolic gutter secondary to disruption of the suture line at the gastric curvature.

The duodenal stoma site was covered with adherent oedematous granulation. It was not disturbed and the duodenal fistula was not re-anastomosed. The original drain was kept on site.

The anastomotic leak was closed and the abscess drained through the left flank and subcostal region.

After operation the patient improved considerably. He was however unwell two days after operation which recurred slowly.

His urine haematuria was maintained within normal limits by means of potassium electrolyte and fluid replacement in spite of urinary drainage on the region of 750 ml per day.

Seven days after his second operation methylene blue given via the nasogastric tube appeared rapidly on the drainage showing that an anastomotic leak occurred.

At this stage buriodol and Amiescol therapy was commenced.

One litre of Intralyd and one litre of 10 per cent Aminoacil were used initially providing 2,500 calories per 24 hours together with normal saline 4.5 mm and dextrose saline with added potassium amounting to 40 m eq/l per 24 hours. Electrolyte balance and a satisfactory urinary output were maintained without difficulty.

The anastomosis held intact on 12 days and a Springwell's study outlined the stomach contents, the afferent and part of the efferent loops without evidence of leakage.

Recovery thereafter was procured by the surgical drainage of abscesses of the right abdominal wall at two occasions, presumably the result of postduodenal or duodenal and a left-sided perforation.

The patient was maintained entirely by parenteral nutrition for 42 days from the fifth post-operative day except for occasional  $\text{NaCl}$  infusions to ameliorate the dry comfort of his nasogastric tube.

Seven days after initiation of therapy the hospitalized and 10 per cent Antigonist were supplemented by Antagonist Triacetic Ethanol. The adjusted regimen thus provided 5,193 calories per day.



Figure 1

The patient's general condition improved and gradually all wounds dried up and healed except for the biliary fistula which continued to produce mucus, ranging from 100 ml to 150 ml.

After the six-week course of intravenous protein and fat the nasogastric tube was removed, having been in use for eight weeks and on feeding with a high protein diet of 150 g per day was continued.

The patient's condition clearly improved and on the 124th post-operative day the biliary fistula closed. The patient was fully ambulant and increasing his diet daily.



*Figure 11*

The happy state of affairs did not persist however. Fifteen days after the biliary fistula healed the patient was struck down by severe right-sided abdominal pain associated with right shoulder pain.

A right nephrostomy sheath which had ruptured and leaked down the right peritoneal space was drained 48 hours later. The following day the urinary tract was re-established and continued to discharge 300-400 ml of bile daily.

A further course of 1 litre each of intravenous Ammonium and Intralipid was used to supplement oral feeding daily.

Once again his post-operative course was marked by collections of pus due to the suprapubic region and two in the pelvis, all requiring surgical drainage.

The biliary tract (Fig. 1) continued to discharge in the absence of any obvious loop obstruction as demonstrated by Gastrografin studies. The patient's general condition however remained very satisfactory and spontaneous discharges occurred 150 days after his original partial gastrectomy (Fig. 2).

### DISCUSSION

The patient received, in all, 44.5 litres of 10 per cent Ammonium, 50.5 litres of Fructose Glucose and 41 litres of Intralipid over two periods of 6 weeks and 15 days a total of 55 days (Fig. 3).

Number of Days	Volume of 10% Ammonium Administered	Volume of Ammonium 10% Administered	Volume of Intralipid Administered
42	50.5 litres	20	11
14	10	21.5	30

Barbitone/Day 50

1 litre 10% MAG. SULFATE  
1 litre 10% DEXTROSE 50%  
SALINE

Daily 500

Approximate 100 mg/kg/day potassium

Figure 3.

The infusion rate administered intravenously and supplemented by normal saline and 4.5 per cent dextrose at 8-10 per cent saline which were also employed as vehicle for the administration of potassium chloride, potassium acetate and when necessary, antibiotics.

The average daily volume of intravenous fluid was 4.5 litres and the patient's excellent renal function led to urinary outputs ranging between 1.5 to 4.5 litres. The blood urea remained at normal levels and repeated urinalyses failed to reveal any abnormality (Fig. 4).

Intravenous administration of these substances did not involve any special difficulties and there was no increased incidence of thrombophlebitis. Superficial veins utilized the infusion well and could be kept patent for 6 or 7 days before the first incidence of sclerosing along the line of the vein became manifest.

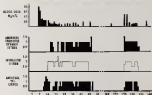


Figure 14

It was found that a level drop set up over the long nephrotic run, as the group was about for the postoperative intervention therapy. No adverse reactions were detected at any time, unless a lot of interest in note that the patient experienced a feeling of well being, particularly during the administration of furosemide. There was no delay in wound healing.

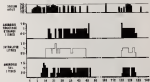


Figure 15

By reference to the following graphs (Figs. 14-16) it will be seen that the steroid pattern was maintained satisfactorily and the serum proteins (Fig. 16) which were depressed during the critical phases of his disease, were restored by



administration of the asparagine protein component. The weight of the patient showed an early sharp fall but while on parenteral nutrition the fall became more gradual. Slightly stabilizing in decline on the graph.

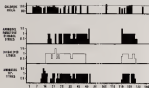


Figure 10

The elevated serum fibrinogen levels (Fig. 11) appear to be directly related to the repeated blood transfusions. No antibodies were ever demonstrated in the patient's serum but it is known that 30 per cent of the red blood cells are destroyed 24 hours after the transfusion of blood that has been stored for 14 days.

In normal circumstances the rate of clearance of the plasma fibrinogen by the reticulo-endothelial system is proportional to the square of the plasma fibrinogen

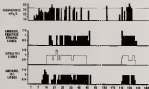


Figure 11

concomitant. Thus the greater the number of cells destroyed the greater the risk of clearance (provided therefore does not cause depletion) (1984).

Depletion will occur as a liver whose normal function is proffered with in the same time as the breakdown of haemoglobin is proceeding. In this case the slow fall in the fibrinogen and albumin phosphate levels in serum may well be related to the liver cells being saturated with fat from the haemolysed. Heparin was never employed to clear the liver of fat and restoration of the liver function values to normal occurred spontaneously.

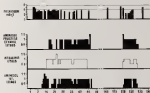


Figure 10

The fluctuation in the haemoglobin levels is directly related to other blood loss, as reported in the total area of the patient. This was clearly shown by the rise in serum levels in the patient improved. There was certainly no evidence that intralipid or Amersol produced an anemic or thrombocytopenic.

Finally the volume of urinary discharge appeared unrelated to either the volume of intravenous fluids or the volume of oral feeding; the range being 120 ml to 470 ml. These values suggest a intermittent obstruction of the afferent loop at the lower curve which if the patient's condition had allowed, would have required catheterization to allow the fluids to flow.

Thus it is evident that these compounds Amersol and Intralipid sustained the patient through the highly unusual phase of his illness, perceived has done so by providing the necessary fluid of high volume content and protein in the correct form to overcome the gross reaction that would otherwise have, followed with its end of failed completion.

It is impossible to relate monetary value with human life but it would be per usual to indicate that the cost of this aspect of the patient's treatment was £644.

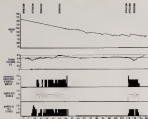


Figure 15

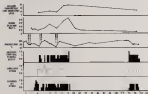


Figure 16

More widespread use of these compounds must be to some measure retarded by the cost and it is sincerely hoped that the manufacturers will be able to produce them at lower cost very soon.

Indebted acknowledgements are made to the Medical Director General of the Navy for permission to publish this report and to Surgeon Captain I. Wall, MSc FRCS Professor of Naval Surgery for his help and guidance in the production of this paper.

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## AGGRESSIVE PSYCHOPATHY

### A Clinical description of violent psychopathic inmates in a Special Hospital

By Surgeon-Lieut-Commander D. H. Huxley, R.N.

While aggressive psychopathy is a common clinical problem and the symptoms well known, yet it is unusual to meet several such patients in one unit and where psychopathy is left to deal treatment in a special hospital.

These patients pose grave problems in management. In all but one case they have been in other hospitals or in penal institutions. They are frequently aggressive and this is usually directed against the staff. They excite and excite each other and this again leads to aggressive behaviour. If their aggression is checked they become violent, subvert or are harmful to themselves or become destructive of property. When mixed with psychotic or involuntarily patients they cause their distress by their disturbed behaviour.

#### Reasons for Admission

Seven patients are detained during Her Majesty's Pleasure. Two patients have committed homicide, four attempted homicide and one injury.

Five patients have been transferred from prison or borstal under Section 73 of the Mental Health Act of 1959. Two patients have been sent by a Court under Section 60 of the Mental Health Act.

Two patients have been transferred from other hospitals having been detained under Section 26 of the Mental Health Act.

#### Previous Delinquency

Five patients have previous convictions as five patients for acts of aggression and as four for larceny.

#### Age on Admission

15-25 years	6 patients
26-35 years	7 patients
36-45 years	2 patients
46-55 years	1 patient

#### Symptomatology

The characteristic symptom is aggression. It takes the form of aggression to work others, to property and to the self.

#### Aggression to Others

Two patients have committed homicide. One strangled and the other cut his or fellow patients. Four other patients have strangled homicide. In five out of these six cases the victim was a patient or staff member of a mental hospital.

All attacks are aggressive towards the staff and in some cases the aggression appears to reach homicidal intensity.

Many of the incidents resulting in aggression within the hospital may be the result of unsatisfactory possibly homosexual relationships. These are between

members of the patient group for the nursing staff may become recipients of such attachments. Hallet and Florida (1962) describe similar behaviour at first in two inmates in a progressive community institution in Wisconsin. They suggest these attachments result from the interaction of these depressed girls and the protective care of their institutional environment. This leads to hysterical pathology and attempts to control each other's behaviour and reflects these desperate attempts to protect yet another relationship ending in rejection. Very similar reactions are involved in this hospital's prison.

While the aggressive reactions observed appear to be due to compensatory interpersonal relationships, others appear to arise without apparent provocation. These patients display short lived bouts of irritability which do not appear to be connected with outside events. During this time aggressive reactions are most likely to occur. In some cases this may have a pre- or post-menstrual phenomenon.

#### **Aggression to Property**

All these patients have damaged or destroyed hospital property. Breaking is the most common followed by breaking windows. The latter may also result in self injury. These patients partly express their aggression by smashing boxes.

#### **Aggression to the Self**

All the patients have injured themselves. The commonest way is cutting their wrists while breaking windows. This can result in serious injury. One patient suffered an ulcer nerve pain and the other several finger wounds. Cutting and scratching the body mostly the arms and thighs, is common — often with pieces of glass severed after an episode of window breaking. Since the progressive introduction of safety glass this form of behaviour has of necessity declined. However, swallowing of foreign bodies seems to have replaced window breaking as a method of self injury. At least ten of the inmates have cut fingers upon handles and doors, needles or pins. Five patients have come to hospital with one patient on two occasions. One of these five patients periodically swallows foreign bodies as chewing glass. On one occasion a piece of glass stopped in the upper oesophagus and had to be removed.

Another but apparently short lived episode of self injury was hand banging. One morning it was found that five patients had banged and banged their heads during the night.

There is obviously an element of imitation in this behaviour but a clear urge to give relief from the severe tension felt by these patients.

All inmate patients have attempted suicide. The behaviour already described studies over time were obvious suicidal attempts. Otherwise these methods appear to be most often up the neck with iron bars, raising the wrists or throat with glass and outside of hospital windows of glass. In at least three cases the attempts could have ended fatally. Though suicidal attempts are at times more prolonged the same patient may carry out an apparently determined attempt.

The symptoms now described are often called "shock equivalent" reactions. Perhaps a more fashionable term would be "reactions due to failure of aggressive feedback". These patients show an inability to control their aggressive reactions, say

epileptic impulse leading to go unobserved to someone. There is frequently no sight into the road the patient is on and the family is just left to guess at the aggression.

#### **Impulsiveness**

All the patients display the symptoms frequently at random, for no reason usually applied to aggressive disorders, it applies to other emotional changes from man to laughter from calm to despair. The quality of the impulses inherent at times recalls the impulsive state of the schizophrenic patient.

#### **Affective Symptoms**

Major-Galea, Slater and Roth (1960) point out that mood changes are probably the more common mental symptom in epilepsy. They also emphasize the sudden variation in mood on sudden onset and usually in short duration.

All the patients described in this paper show such short term mood changes perhaps better described as mood lability. Variations in mood are often related to the personalities and problems associated with attachment to persons and still have apparent relation by the receipt of these letters made in aggression by forced and subsequent despair.

Most patients show normal depth of emotion and are capable of warmth and in some cases strong emotional attachments. But any attachments they do make are likely to be destroyed by their frequent aggression. In two cases there is some mood depression and even dystonia. Both of these are known to have suffered brain damage - one has suffered a severe head injury and the other has undergone unilateral temporal lobectomy. Only one patient shows mood changes lasting for more than a few days. There are, depression and response to treatment with E.C.T.

#### **Perceived Hostility**

Four patients and one out-patient insist on being unconscious specifically named as themselves and are each aware in reason for their aggressive behaviour. The evidence does not seem to reach the stage of delusory formation or hallucinatory experience. There is of course considerable 'projection' the staff are aggressive and the patients of unreasonably aggressive in return.

#### **Epileptic The seizures**

Nine of the seven patients suffer with epilepsy but epilepsy tells all patients about the same behaviour disorder.

#### **Partial Epilepsy**

**Motor Epilepsy.** This patient has a short right sided convulsion. Gaskell, Roger and Quake (1963) describe a very similar type of epilepsy called by them 'benign chronic epilepsy'. In this hospital patient the fit starts as a stare, incontinence, with turning of the eyes head and body to the right. On recovery they will roll about the room. This then passes into a clonic phase. The whole attack more than only a few minutes but during frequent seizures it may last for days and only be terminated by E.C.T. At these times it deserves the name of epilepsy partialis continua. One patient who is held tight on the walls when the head rolled on the pillow. The seizure may be observable during the clonic phase - can often occur

mean, obey simple commands and speak simple phrases. These phenomena have led to the suspicion of simulation or hysteria. But each patient shows temporary paralysis of the affected side after the fit has ceased and the random actions are also disturbed. During the fit there is an extreme pleasure response on the apparently unaffected side. All three have grand mal seizures. It is of interest to note that the fits were in two cases apparently precipitated by treatment with Chlorpromazine (Largactin) and in one case exacerbated by such treatment.

#### **Seizure Epilepsy**

One patient who has had a left temporal lobectomy no longer has control over her left side the rest of a tingling in her right hand.

#### **Psychical Epilepsy**

Three patients describe transient hallucinatory experiences. Two epileptic patients become vividly aware of the people they have situated and the experience is accompanied by emotions of fear and grief. One patient with no evidence of epilepsy has the experience of seeing a dog come into the room and sit on the bed. She can see the dog and feel its weight on her legs.

#### **Automatism**

Five epileptic patients show periods of confusion associated with impairment of memory and they can carry out apparently purposeful acts. These acts may be appropriate but need not be. For instance one patient emptied her chamber into the wash basin and lost the toilet. She really believed she had used the toilet and felt that the other patients who remonstrated with her were unreasonable.

#### **Lack of Consciousness**

One patient wakes slowly and gradually to the ground, is apparently unconscious and remains without a consciousness of a minute or so. One such attack was followed by a grand mal convulsion.

#### **Pre- and Post-ictal Exaggeration of the Behaviour Disorder**

Eight patients display pre-ictal and two post-ictal exacerbations of their own shown traits.

#### **Response to Anticonvulsant Medication**

Four patients have shown the phenomena described by Gibbs, Purdy and Richards (1959) of the exacerbation of the behaviour disorder when the control was not controlled by medication.

#### **Relationship between the time of onset of fits and disturbed behaviour**

In six cases the disturbed behaviour preceded the onset of epilepsy by 3, 3, 4, 10, 13 and 14 years respectively. In one case the fits and behaviour disorder started about the same time and in one case the fits preceded the behaviour disorder by 14 years.

That the behaviour disorder has preceded the fits in so many cases is obviously of diagnostic and aetiological importance.



### Possible causes of epilepsy

One patient had a severe head injury.

One patient had meningitis as a child.

One patient had, as a child, severe pain crises complicated by a febrile seizure.

### E.E.G.

Eight patients, two of whom are epileptic, have a normal E.E.G.

Three patients (two epileptic and one non-epileptic) have abnormal (abnormal) E.E.G.

Two patients have a confirmed left temporal focus and one patient has an epileptic record suggesting a left temporal focus.

Two patients have a left parietal focus. In one patient it indicates a previous lesion of the skull.

### Emotional disturbance

Nine patients have been separated from their mother at an early age and for long periods of time.

### Discussion

The sixteen patients described were all the family patients in a Special Hospital during one year who displayed psychopathic behaviour. No patient showing other types of mental disorder except epilepsy was included. Three other patients might have been included: one was schizophrenic and had displayed a hysterical-type psychosis in the past, the other two were epileptics and also suffered with a paranoid psychosis.

It is evident from this is a highly selected group of patients: not only were they included to be psychopathic within the meaning of the 1959 Act but to be also of dangerous or violent propensities and require admission to a special hospital.

The syndrome is very similar to the one described by Hill and Winstanley (1942) and called by them "Disruptive, aggressive behaviour disorder". Hill and Winstanley were an association with epilepsy rather in the family history or as occasional fits in children. They describe these patients as emotionally unstable and particularly liable to anger, aggression and to episodicness of behaviour. They come into conflict with society, may feel themselves in prison for crimes of violence and use excuses to every one except. Their moods are variable and they are irregularly angry, depressed and unstable.

Schneider (1955) used the concept of epileptoid psychopaths and classified these patients under the heading of latent psychopaths. Corney (1957) describes similar behaviour using the title of epileptics. However, Schneider also classifies very similar patients as a epileptoid psychopaths. Schneider appears to make the distinction between epileptoid children and epileptoid psychopaths on the basis of a positive family history in the former.

Craig, Fehrlin, Stephenson, Bennett and Karpidge (1965) divided disturbed psychopaths into two distinct subgroups which an earlier review by Craig (1960) suggested might exist. The second subgroup described by Craig consisted of those felt to be emotionally immature. Such patients were characterised by marked

short (mean duration: epilepsy, temperament and anxiety questionnaire answers for their age). It was assumed that only (a) boys living with the family (b) 10-14 years old by age-onset, (c) non-epileptic, (d) small families.

The association of epilepsy with aggressive "punchy" pattern is well established, particularly its association with temporal lobe epilepsy (Gibbs, 1940). Epilepsy occurs in most of the tension patients described but it is only significant that the psychopathic behaviour preceded the fits in six cases by intervals of time between three and fourteen years. In all cases the behaviour described is apart from the epileptic phenomena: identical in the epileptic and non-epileptic patients.

Ford (1960) and Smeets (1962) suggest that when psychiatric symptoms are associated with epilepsy, the epilepsy may be an "epiphenomenon": the psychiatric symptoms being the result of the brain itself. Gibbs (1941) suggests that in temporal lobe epilepsy the behaviour disorder and the epilepsy are independent components and are to some extent unrelated. However in this case pre-ictal excitation of symptoms is the rule. The association Gibbs notes between the control of epilepsy by anti-convulsants and the remission of psychiatric symptoms has been noted in the series. However it should be noted that two of the present series of patients had their epilepsy apparently precipitated by Largactil.

Two hypotheses to explain these present symptoms suggest themselves:

- (1) That this behaviour is the result of an organic lesion of the brain. This hypothesis is that the principle of the logic of symptomatology applies directly included: that organic lesions alone in the result of pathological change and produces negative symptoms: the other symptoms completing the symptomatology and arising in the activity often exclusively of bodily nervous arrangements and its chemical physiological state" (Hastings Jackson 1960).

The negative symptoms observed in these patients is loss of emotional control (understanding). This symptom has no name and until a symptom has a name it is difficult to treat it in its entity. The positive symptomatology is their psychopathic behaviour and epilepsy.

That there is an organic lesion present in these patients is suggested by the presence of epilepsy in more than half the number. In those who show no epilepsy perhaps the lesion or lesions are not always epileptogenic.

- (2) Many of the patients have had a disturbed childhood. This may have led to the disturbed behaviour. But the disturbed upbringing may have other effects. It may be that lacking family support the patient is more likely to respond symptomatically outside the family and thus come into conflict with society. Also that with no proper family support the patient will be less suited to an institution rather than be discharged or placed on probation or other forms of supervision.

There may be a causal circle of disturbed behaviour—institutional care—more disturbance—more strict institutional care.

But these two hypotheses can be brought together. If a patient who is pre-disposed to renal degenerative defects, renal renal vascular, then she is much more likely to present to a severe behaviour disorder—even reaching state to a sustained sensory hospital.

#### Summary

Severe young female patients in a Special Hospital are described as showing a syndrome characterized by aggression to property to self and to others, attempted suicide associated with marked and rapid changes of mood. None of the patients with epilepsy.

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## Articles

## MEDICINE AND SPORT

By Surgeon-Captain Stanley Miles, R.N.

## INTRODUCTION

The changing pattern of life in this age of scientific achievement is taking its toll. Interesting leisure, mechanical aids, radio and television are making more and more people lazier and lazier. If chronic immobility and physical deterioration are to be avoided a planned attack must be made on the complex contemporary problems of sedentary life.

Doctors have a vital and responsible part to play in the movement but they will need a new and creative approach.

Medicine today, by and large, falls into two groups. Preventive Medicine which aims to protect man from illness and is run by education and control of his environment and Therapeutic or Clinical Medicine which is the learned art of taking patient may be restored to his former state of health or an accepted convalescent.

Experience, practical skill and an understanding of the human body is essential in both these fields. Why state all this however? Such skills can easily be directed towards improving the individual state of health and well-being. There must be very few doctors whose standard of physical and mental fitness could not be improved. The medical profession is well equipped to take a very active part in any crusade to raise the levels of physical well-being in the community. They have the experience and gained the responsibility to build on and extend a third great field of medicine. POSITIVE MEDICINE.

The professional purpose is thus twofold—to protect man from the unforced hazards of his environment, to make the sick man well and the man who is well fit.

## THE REVIVAL OF SPORT AND RECREATION

It is true to say that in the modern climate there is a growing awareness of the advantages of sport and recreation. Outdoor activities, both woods and waters, competitive games and many indoor occupations and hobbies are a welcome answer to unstimulated brains and muscles. In spite of this encouraging sign there still remains a very large section of the community which is content with a sedentary low standard of fitness and who find life much too easy. Many are content to watch the performances of others on the screen or in the sports arena. They observe enthusiasm in the reflected glory of the houses with whom in their imagination they are identified. Without these amateur athletes and civilian dilettanti professional games would not survive. The professional sport however is not without great value. It serves as a pattern for the amateur and its codes for the analysis of its supporters. As positive medicine or sports medicine develops the professional may well become subject for scientific research.

## SPORT AND THE DOCTOR

Most sports carry some risk or danger. Without this they would be meaningless. With organized groups and, in particular, the governing bodies of the major sports have their medical advisors. They become extremely concerned in the dealing with the medical problems of their particular sport and soon have themselves in their youth sports centres as if. Thus a doctor should have been a champion in a particular game does not necessarily qualify him, in becoming an expert in Sports Medicine.

Sports Medicine, which flourishes in America and other countries, is relatively new in Britain. It has not yet fully gained its place of respectability in the eyes of a wary lot of medical specialists. It must and will gain and be established until Consultants in Sports Medicine take their rightful place amongst the hierarchy of the professions.

Sports Medicine, steadily involves many specialists and its ultimate success will depend on co-operation, understanding and goodwill between these, the physical characteristics and sports administration.

The **PHYSIOLOGIST** has made the most contribution to make. He can study the athlete as nature seems the balance between physical material and environmental stress. To him trainers look for advice in correction of their short points and errors. He will be concerned with research into problems of 'wear and tear' strains, strains, the concentration and distribution of effort and the weight maintenance of the active body. An example of his value is the recent report by Pugh (1966) on the effect of altitude on Olympic Games.

The **PSYCHOLOGIST** has not yet been fully involved but he has a splendid opportunity and his help is indeed desperately needed to investigate the much neglected subjects of motivation and selection. He can help too in studying the benefits of training.

When questions involve legal points in various medical, e.g. Olympic and Olympic Games, advice from the **MEDICAL HYGIENIST** is needed if their high standard of fitness is not to be impaired by water treatment and medication in foreign, bad weather, strange diets and local ailments. Prophylactic drugs and treatments must be carefully chosen and timed.

The most established specialist in this field today is undoubtedly the **ORTHOPAEDIC SURGEON**. He is already familiar with sports injuries and will like to advise on their prevention and treatment. Though the majority of sports injuries differ little from those elsewhere, there are a number of specific injuries peculiar to various sports (Williams, 1965).

**PHARMACOLOGISTS** and **BIOCHEMISTS** too are being brought into the picture not only in problems of diet and metabolism but with the increasing and rising use of drugs which is causing great concern to national and international sports organizations.

Much has been written about doping and in recent years certain sports organizers have made it compulsory that competitors should at the end of an event give sports men of value for use if demanded. Though dope-taking cannot be too strongly condemned, recourse to testing of individuals would seem a gross interference with

individual freedom and to make judgments through a rational choice (right or wrong) about the value of sports. The value of sports for individualism, for all I should say so, is more effectively the source of "inspiring" it - in sound education. Men and women should be taught to see it rationally that the practice is neither harmful and rational. The price that is paid for temporary improvement in performance may be an attitude in risk of life or ultimately a permanent impairment of health.

Even the GENERAL PRACTITIONER or FAMILY DOCTOR must consider himself closely with sports medicine. Sports injuries are always common to his surgery but his greatest contribution will be to preventive practice medicine. He will have special opportunities, to anticipate, the patient not to be content with recovery from illness or injury but to strive for greater fitness.

Indeed it would seem that there are few specialties in medicine which will not contribute in some important way to sports medicine.

#### MEDICINE, SPORTS AND THE SERVICES

The Service has a special problem in maintaining a high standard of morale and physical fitness. Even though in the present day pattern of the Service a large percentage of men are employed in duties demanding mental rather than physical output the policy still remains, and rightly so, that every serviceman should at all times be in the peak of physical condition. The reason for this being that in a battle situation or other state of emergency services may be called upon for the supreme effort. This of course makes the task of the selection extremely difficult particularly in a period when recruiting is at a low ebb and the interests and considerations of civilian employment compete strongly with any call to arms. However, throughout the war years

Great are the days when one recruit could be drawn into a situation, out of tough demanding, endurance tests. To maintain the overall complexion almost every volunteer who passed minimal medical standards must be accepted. In the war days when the supplies of recruits were recruited to young men they were naturally receptive to progressive physical development. This lowering of bars is no longer acceptable and the further demands of the special branches, in particular, are many in many cases that severely training. Thus one criteria for a Service career tend to include an increasing proportion of older, continuously experienced individuals. There is however no physiological reason why any relatively normal individual should not be trained or coaxed into a "voluntary" high standard of physical wellbeing without prejudice to the demands on his mental ability. To achieve this, however, is a completely new and rational approach. Both physical training by and large naturally of continued two enthusiastically will only result in an unnecessary and unacceptable waste of resources. There has inevitably been in the past some considerable return in the intelligence of the recruit recruitment. Many of these would regard that making physical training and the total practice of embodying disciplinary responsiveness, is unacceptable to a thinking individual. There is of course no time in an individual's preparation for his career without it. The only way in which intelligent beings can be made to accept mentally custom training is that they should appreciate the need for them. The same applies to the achieving of a high standard of physical fitness. This is closely linked with good morale, an equally essential object to make one efficiency

Even the most sophisticated bodies will carry out his duties with greater pleasure and efficiency if he can at the same time enjoy the benefits of a strong and healthy body and a belief that what he is doing is of the utmost value to himself and his community.

In recent publications many attempts have been made to draw up exercise routines aimed solely at maintaining and improving physical fitness without encroaching too much into the daily working routine, and regrettably in many cases without trespassing on the individual's off-duty time. These though efficient if carried out punctiliously tend to become tedious and are frequently discarded as less there is extremely strong motivation to pursue them. Sport, on the other hand, offers not only physical exercise but interest and competition. It does however, in its worthwhile variety, involve considerable time expenditure and personal effort. Somewhere between these two must be a compromise and in finding this there is a need for thoughtful research by doctors interested themselves in sports medicine.

The Navy has a real interest in this direction—unlike the other Services whose units are established in shore bases with adequate recreational facilities. Large groups of us may be ordered to repeated accommodation on ships for long periods. The maintenance of a high standard of physical fitness is a major present day problem particularly as the making of these ships demands less and less physical effort and more and more brain power and better patterns. Deck space too is decreasing and even being used as a parking lot. Fortunately this problem is now being tackled as the recent formation of a Working Party on Physical Fitness by the RANMC has shown. The importance of the work of this committee cannot be too strongly emphasized and the outcome of their deliberations is awaited with interest.

The enthusiasm with which the fighting Services regard sport and physical fitness and the fact that as the training establishments large numbers of young men are kept together for long periods gives them a unique position in the service with need to expand interest in recreational activity.

#### SUMMARY

The important responsibilities of the medical officer in sports medicine have been stressed with the hope that all young doctors joining the Navy will feel that they have opportunity and responsibility beyond the practice of conventional clinical medicine. Perhaps the greatest contribution that any doctor can make to the efficiency of his ship or establishment is for him to take an active part in the building up of morale and personal health. There is today intense wide evidence of the growing interests of certain sections of the medical profession in the field of sports medicine and both praise and encouragement must be given to the relatively newly formed British Association of Sport and Medicine which already has a number of Service members. If the Navy is to maintain its pride of place it must shed any feeling of dependency and gain control out of its tradition and responsibilities to establish itself without question as the first and finest fighting Service.

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## AUDITORY DISCOMFORT ASSOCIATED WITH USE OF THE AIR TURBINE DENTAL DRILL

By Surgeon Commander (D) A. F. J. Smith and  
Surgeon Commander R. E. A. Cole, RN

The following report is of interest in that two successive dental officers developed vocal symptoms after using a ball-race type electric drill.

The same hospital working premises (12 psi) and operating room were used. Both operators were right-handed and favoured the seated working position.

Dental officer 'A' had served for approximately one year and three months with the drill as normal use when he developed pain in the right ear which continued concurrently as the noise continued. At the end of a working day (noise in both ears was prolonged) eventually becoming continuous over several hours.

Dental officer 'B' arrived as relief for 'A' and reported a right ear transient after three weeks normal surgery. After a further week, otalgia and headache developed when using the drill. Pain ceased when the drill was removed, but tinnitus and vertigo replaced the pain for some hours after work, causing a 'flashes to darkness' or something within the ear.

The feeling of right ear involvement in both right-handed operators is at least associated with other surgery the most common of which was recently reported by Taylor, Pearson and Miles (1960).

Both officers were referred for audiometric and clinical tests, which were normal and apart from a slight threshold elevation in the 6000-8000 cps range for 'B'. They were found to have returned to normal when asked after a week's leave. Measures adopted to counter the vocal discomfort included use of glass-down ear plugs, change to conventional low speed drill and change of air turbine air-bearing headpiece in that order. The air-bearing headpiece requires an adjustment to 60 psi water in the air supply and having no ball-bearing mechanism is much quieter in operation.

To eliminate the question of a reverberatory factor from the large area of glass in the bay window in front of the drill sound level measurements were carried out with a Doms sound level meter and microphone fixed both in the supply tank covered and with the same type microphone in an adjacent empty tin can. From running five or more recordings were made of the noise produced by (1) the test headpiece (2) a control headpiece of the same type and age and (3) the newly installed air-bearing headpiece. The microphone/earrse distance was 12 inches in suitable working conditions.

There was little difference overall in the test and control readings with the ball-race type headpiece but the difference in the measurement at 8000 cps suggests that the noise problem was more likely to be due to worn bearings in the test headpiece than to a reverberatory factor.

Comparison of the recorded sound pressure levels with the maximum recommended sound-pressure level shows that the noise of control headpiece is a distinct



Situation	Overall level	Overall frequency level 100 to 10000 Hz (in 10 Hz)							
		Level at various bands of hearing frequency (in dB)							
		40	125	250	500	1000	2000	4000	8000
Control group and control headphones	95	not tested (no ambient noise level)			45	55	65	75	75
Test group and test headphones	90				45	45	55	65	65
Test group and control headphones	95				55	55	65	65	65
Test group and test hearing headphones	85				55	55	65	65	70
Overall risk exposure for July 2 hour programme (OCC/BAE 2040-2045 hours 1945)		45	55	65	65	65	65	75	75

exposure based on the direct exposure. Further, as the subject was undoubtedly within quiet zone elements in the 4000-8000 c/s region there is not a broad-band noise it would be reasonable to subtract about 5 dB from the exposure curves at these frequencies. Use of ear protection is indicated and plug down earplugs have proved to be acceptable. However, the first principle of a hearing conservation programme is reduction of noise at source and the above table illustrates the advantage of the ear hearing headphones in direct practice.

#### ACKNOWLEDGEMENTS

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## ACUTE ULCERATIVE GINGIVITIS OF THE VINCENTS TYPE

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### INTRODUCTION

The object of this paper is to review briefly the present state of knowledge of acute ulcerative gingivitis of the Vincent type and to consider especially its aetiology and the modern approach to treatment.

### HISTORICAL

This disease has been known certainly since the fourth century BC when, in the writings of Aeschylus it was mentioned that Greek soldiers suffered from foul smelling breath and sore mouths. John Hunter gave a precise description of the condition, clearly differentiating it from scurvy and other gum diseases. It is reported that the French army of the 18th century suffered outbreaks of the disease in epidemic proportions. Winch in an account of the disease in 1855 emphasized such features as enlarged lymph nodes, fever, malaise and other general symptoms. It was not until the end of the last century that Plaut (1896) and Vincent (1898) independently described the disease attributing its origin to the fusiform and spirochaete organisms, hence the name Vincent's disease. The name was used until and during the First World War but because of the widespread incidence of the disease amongst the fighting troops living in the trenches the name 'Trench Mouth' became commonly used. Since that time, however, descriptive terminology has become increasingly and such names as acute necrotizing gingivitis and acute ulcerative gingivitis have found their way into the literature.

### OCCURRENCE

Acute ulcerative gingivitis of the Vincent type is the commonest acute infective disease of the gums which man experiences. Nevertheless, in civilian general practice in Britain only occasional cases are encountered and only rarely is more than one member of a family affected. Cases are, of course, more commonly seen in the hospitals, especially those having departments of paedodontics. There is also good evidence that there is a seasonal incidence of the disease with the number of cases being greater in the winter than the spring, summer and autumn months (Gomes, Foster and Lawton, 1962; Poller & Kohnen, 1957).

In the service, however, the disease often reaches epidemic proportions. This is especially true in war time and there are abundant reports in the literature of outbreaks which occurred during the World Wars of this century. Occasionally there are peculiar outbreaks involving epidemic proportions - recent example of which occurred at RNAR Cadiz.

## M. tuberculosis

## Communicability

Details of how communicable human tuberculosis, producing large numbers and efficient, long-persistent droplet nuclei, differ from *M. tuberculosis* in cats are not known. However, the fact that droplets from cats are probably much less viable or other commensal flora, possibly, enter as in the human type, is inferred and patients are instructed to take precautions, such that their levels cause infection, are not used by others.

However, experimental evidence, both of laboratory and clinical nature, has not confirmed the disease as being contagious. For example, King (1943) attempted to induce the disease in his own family by introducing droplets containing heavy concentrations of bacteria from a severe case of the disease. He was unsuccessful despite severe falls from his papers which show large numbers of the so-called Virchow's clumps. These heavy masses, disappeared after 3 days and no clinical evidence of the disease appeared. However, on one occasion for humans, ill and eventually characteristic lesions appeared in the inoculated case. This single experiment does suggest that a systemic display was possible for a predisposed, host.

Further evidence against the disease being communicable is from the work of Harwood and Pryor (1942) who failed to find faecal-oral and respiratory or feeding contacts. This finding is clearly consistent with the fact that the organisms require a particularly controlled aerobic environment for growth and viability.

In view of these findings a number of theories have been offered to account for the intensive occurrence of the disease within specific communities. However, the most likely explanation seems to be the presence of one or more, constant predisposing factors, some of which will be considered below.

## Systemic Factors

Although laboratory and other findings have failed to confirm that the disease is contagious it is certainly wise to maintain all large individuals to take suitable precautions to prevent any introduction of large numbers of organisms. King's report, more together with other clinical observations, suggests that debilitated man may have not had resources to take on and so may be subjected to the disease. King (1943) also showed that of 100 inoculated Army patients with acute ulcerative pyrexia. It was either suffering from a constant cold at the time of inoculation or had had one recently.

Other systemic debilitating diseases which have been suggested as predisposing of some, include malnutrition disease (including leukaemia, cystitis, osteitis, active and other proto-infectious disease, diphtheria, measles, respiratory infections and many others).

Nutritional deficiencies, either primary or secondary to disease have also been suggested as predisposing role. Several workers (Smith 1952, Miller and Rhoads 1931) have shown that the disease can be induced in animals with maln or V<sub>6</sub> A deficiency. King (1940-1943) believing that hyperaemia was an important

antiseptical factor, even by passive vitamin supplements and reported medical records. However, since the treatment was combined with local measures it is difficult to evaluate the true role of vitamin therapy. On the other hand, Harman (1944) on a series of over a thousand patients, was unable to show any beneficial effect of vitamin supplements. Other clinical observers have suggested that Vit. C deficiency may even predispose to the disease.

A further factor which has received increasing consideration in recent years is stress. There is no doubt that under conditions of war when large outbreaks are most common, personnel are under considerable stress and anxiety. In peacetime of course such conditions are less usual, but it is certainly true that no epidemic mass virus does occur. Owing to the problems of timing stress and anxiety it would be extremely difficult to evaluate precisely the relationship between stress and this disease, but nevertheless clinicians who encounter large outbreaks should bear the possible predisposing factor in mind.

#### Local Oral Factors

Although the role of the predisposing factors discussed above is open to dispute and considerable doubt, there is no question of the dominant role of local factors. Acute ulcerative gingivitis of the Vincent's type usually occurs with only occasional but notable eruptions as outbreaks of epidemic proportions in troops in which there is a pre-existing chronic gingivitis or periodontal disease. Deep periodontal pockets and periodontal bags associated with partially erupted teeth are particularly effective seats of infection. Not only referred to these areas as "infectious areas" which repeatedly furnished the proliferation of the organisms associated with the disease.

The important role of local factors is evidenced by the remarkable improvement which takes place when oral hygiene is improved and stagnation areas are eliminated.

#### BACTERIOLOGY

Microscopic examination of a stained smear of material taken from an abscessing lesion will show a dense mass of red and filamentous shaped organisms. In the early phase of the disease these organisms are present chiefly in the exudate of the ulcer, but after 2 to 3 days other organisms begin to appear in the stained film. Of these the principal organisms are the *Dorvillea* Faurels and the *Streptothrix* Jones. Both are gram negative, anaerobic and as has been pointed out above are difficult to culture.

Although the presence of these organisms in high concentrations is associated with acute ulcerative gingivitis of the Vincent's type, their precise etiological role in the subject of disease is not clear which comes from the lesions of the bacteria. In support of a primary etiological role for the bacteria there is histological evidence of *Tanachella* demonstrating organisms deep in living tissue in 1936. However, Hunter's (1942) observations on material obtained from patients with or without oral failed to confirm these findings.

On the other hand, the Vincent's organisms are to be found in clinically healthy mouths and in association with many oral inflammatory conditions—examples of which are periodontitis complex and chronic marginal gingivitis. However, in these circumstances the number of organisms found is markedly less than in acute ulcerative gingivitis of the Vincent's type.

Chickman (1964) has summarized the problem and has expressed the more prevalent view that acute ulcerative gingivitis of the Vincent's type is but one of a group of similar diseases caused by a "complex of factors" which includes not only the Vincent's organisms but other spirilla-like cocci and vibrios among other things involved susceptible to infection by a variety of predisposing factors, some of which were considered above.

Recently MacDonald (1965) and his collaborators have suggested that an important component of the bacterial complex in the organism *Leptotrichus melanogenus* (Reveres, LeMay and Carter (1964) using a semi-quantitative semisolid fluorescent technique with barbitone Vincent's spirilla and *Leptotrichus melanogenus*, has been able to show an antibody titre in patients with the disease which differs from that of the controls. This study throws doubt on the possible primary role of these organisms in the pathogenesis of acute ulcerative gingivitis of the Vincent's type.

#### PATHOLOGY

The disease in its various pathological stages, namely, is an acute inflammatory disease in which there is destruction of the surface epithelium leaving an ulcerated area usually covered or partially covered by a slough. A histological section through the lesion shows destructive inflammatory changes of both epithelium and connective tissue. There is a surface layer consisting of dead epithelial cells, fibrin, dead and living polymorphonuclear leucocytes and a variety of bacteria, trichinell streptococci which are the Vincent's organisms. Beneath this layer the tissue has varying degrees of densely infiltrated with polymorphonuclear leucocytes, and the blood vessels are dilated and congested.

The presence or absence of organisms in the connective tissue beneath the slough is still open to question and has been discussed previously.

#### SYMPTOMS AND CLINICAL SIGNS

Usually patients present to the dental surgeon complaining of painless bleeding of the gums and foul taste. They give a history of a sudden onset of the condition and often admit to one or more previous episodes. In some instances the patient complains of weakness, lassitude and a general feeling of illness. Sometimes there is a history of acute respiratory ailments, but the significance of this is not clear, particularly since in outbreaks of epidemic proportions it is not a conspicuous feature.

On examination the patient may occasionally appear quite ill, showing all the clinical signs of systemic toxemia. These include severe anorexia, swelling of the submandibular, submental and parotid ductal groups of lymph nodes are palpable and tender.

Examination of the mouth usually reveals a characteristic (late) lesion. In cases of extensive ulceration there is no obvious increase in infection.

The gingival ulcers are variable in appearance involving the interdental papillae and in advanced cases, extend along the buccal and lingual margins of both. The surface of the ulcer is covered by a grey yellow pseudo membrane which is easily detached revealing a raw bleeding surface. The ulcers often heal spontaneously but at the slightest irritation there is a pronounced haemorrhage.

In contrast with the conditions may persist indefinitely causing general damage to the gingiva which is most marked in the interdental papillary regions.

### Differential Diagnosis

Diagnosis of acute ulcerative gingivitis of the Vincent's type is usually made without difficulty. The history and clinical signs and symptoms are almost pathognomonic. However it is occasionally necessary to differentiate the condition from acute herpetic gingivostomatitis. The herpetic lesions occur more commonly in children while Vincent's ulceration is more usual certainly in temperate climates in adolescents and young adults. While herpetic ulceration is preceded by vesicles the formation of Vincent's ulcers is abrupt. Further, in herpetic gingivostomatitis vesicles and ulcers may occur elsewhere in the mouth on the lips, cheek and tongue and are surrounded by a more diffuse area of erythema.

Other conditions which at first occasion require differentiation from acute ulcerative gingivitis include desquamative gingivitis, the so called necrotic ulcerative gingivostomatitis, periodontal abscesses and erysipel or other febrile states. However a clear understanding of these diseases will prevent confusion.

### Treatment

The rational treatment of any disease, depends upon a clear understanding of its cause and natural history. Without precise knowledge treatment is empirical and based upon symptomatic responses to procedures, drugs and substances. Such a situation inevitably leads to multiplicity of treatments each of which is subjected to desperate exploration by our practitioners. Although our knowledge of the pathology and bacteriology of acute ulcerative gingivitis of the Vincent's type has advanced considerably in recent years there is still insufficient knowen of the aetiological details of the disease to regard present day treatment as other than empirical. What can be said, however, is that more rational knowledge has shown that some of the older methods of treatment, whilst effectively relieving the acute symptoms can cause irreversible damage to the gingiva and periodontal spaces.

A consistent theme of discussing treatment would seem to be under the heading, immediate and definitive.

### Immediate

Immediate treatment is aimed at relieving the patient of the distressing acute symptoms arising from the ulceration of the gingiva. Many drugs and procedures have been advocated for this phase of treatment but it is impossible to compile them all as listed in a paper such as this.

# Boric Acid (9400) prepared by various methods

## Organic Laboratory Agents

Boric powder  
 Hydrogen peroxide  
 Sodium perborate  
 Potassium chlorate  
 Potassium persulfate

## Mineral Applications

Clay Marston 1500 (part 1)  
 Marston (part 1)  
 Marston 1500  
 Marston 1500

## Hydrochloric Acid

Hydrogen chloride 20  
 Hydrochloric acid 20  
 Hydrochloric acid 20  
 Hydrochloric acid 20

## Organic Laboratory Agents

Boric powder  
 Hydrogen peroxide  
 Sodium perborate  
 Potassium chlorate  
 Potassium persulfate  
 Hydrogen peroxide (part 1)  
 Hydrogen peroxide (part 1)

## Mineral Agents

Clay Marston 1500 (part 1)  
 Marston (part 1)  
 Marston 1500  
 Marston 1500

## Organic Agents

Hydrogen peroxide, 20  
 Hydrogen peroxide, 20  
 Hydrogen peroxide, 20  
 Hydrogen peroxide, 20  
 Hydrogen peroxide, 20  
 Hydrogen peroxide, 20  
 Hydrogen peroxide, 20

Of these the use of chlorine acid 5%, 10% or 20% applied with dental wax on to the affected areas followed by liberal washing with hydrogen peroxide (12 or 20 vol.) is undoubtedly the commonest method of treatment employed in this country today. No one will deny that this treatment is highly effective in relief of the symptoms presumably due to the caustic properties of the chlorine acid. The hydrogen peroxide has a 5-fold action viz., neutralization of the chlorine acid, the solvent effect of the liberated oxygen on anesthetic agents and its soothing action acting as the removal of sloughs and debris.

However, despite its effectiveness in relieving symptoms, chlorine acid is being popularized on account of its destructive action with unattended use. There is no doubt that repeated applications of this acid precipitate scars, destruction of oral dental papillae and other parts of the gingivae. On the other hand, careful and restricted use of the drug can be an extremely useful means of treatment in the acute phase of the disease.

In recent years a number of proprietary drugs have been introduced amongst which are an acetate, sulfadiazine preparations composed of acetate and a sodium persulfate-methylolacrylate preparation effluent. These have been subjected to comparative clinical assessment (Wade Elder, Marston, Australia and Smith 1961) the sodium persulfate preparation being shown to be superior.

The introduction of penicillin to clinical practice brought a marked change into the management of acute ulcerative gingivitis of the Vincent's type, both the Vincent's organisms being highly sensitive to this antibiotic. Until relatively recently penicillin was given by intramuscular injection either as 250,000 units of benzyl penicillin four times per day or 500,000 units of penicillin procaine twice per day. However, the development of phenoxymethyl penicillin (Penicillin V) which is stable at pH levels found in the gastric juices, enabled the drug to be given orally. The dose found to be effective as 250 mg. four times per day and has been shown

by Wide, Blixie, Blom, Benson, McManus and Sims (1963), to be more effective than the sodium perborate preparation. The advantage of the latter over other routes of administration lies in the fact that control of the drug administration is in the hands of the clinician and not dependent upon the reliability of the patient. In the future, where patients are without any sense of a sick role, the extra-oral route must be preferred.

Some clinicians favour penicillin applied locally to the ulcerated lesions with chewing gum as the vehicle. Each piece of gum contains 1,000 (4000 units of benzyl penicillin) eight pieces are prescribed, each of which is chewed for 4 hours. By the use of gum not only is the antibiotic applied directly to the ulcers, but salivary flow is stimulated which, together with the mechanical action of the gum, helps to cleanse the mouth. In a clinical trial reported by Kinsler, Olson and Minto (1962) it was shown that penicillin chewing gum was markedly superior to the antibiotic oral-powder preparation.

Several objections to the local use of penicillin have been raised, amongst which were included 'contamination' of the patient to penicillin, the establishment of penicillin resistant strains of bacteria and the production of 'penicillin sensitivity'. However, these objections have been dismissed as unreasonable largely by Kinsler *et al* (1962) who concluded that 'provided patients were not previously sensitized to the drug, penicillin chewing gum is a safe and highly effective form of treatment'. Although Wide *et al* (1963) did not include penicillin chewing gum in their clinical trial they drew the conclusion that it is as effective as (phenoxymethyl) penicillin. However, despite its effectiveness in the treatment of the disease, penicillin chewing gum would not seem likely to enjoy widespread acceptance in the clinics or hospitals of the traditional and otherwise thoroughly qualified category of gum chewing.

Very recently a new non-antibiotic drug, Metamizolone (Fluyl, May & Baker) has become available and has been shown by Doughton (1964) to be effective, when taken systemically as phenoxymethyl penicillin. It would also seem that the drug does not have the potential disadvantages of penicillin.

It must be stressed that drug therapy is only part of the immediate treatment of acute ulcerative gingivitis of the Vincent's type and that it must always be accompanied by attempts to clean the mouth and debulk the ulcerative areas. The necrotic sloughs covering the ulcers should be removed as much as possible by gentle use of jetlets of water used under pressure or more. Applications of hydrogen peroxide must be discontinued.

The stage is treatment at which scaling of the teeth should be discontinued has been a much debated topic but it is now generally accepted that it should be undertaken as early as possible and every periodontologist must give gentle scaling at the first visit.

#### **Definitive Treatment**

This stage is aimed entirely at preventing recurrence of the disease and thus depends upon an accurate assessment of the existing and predisposing factors concerned.

Since the disease is almost always associated with disordered and a dirty mouth, thorough scaling and polishing of all teeth is essential. This must be accompanied



by an displacement in real hyperspace achieved only by detailed and repeated interaction prior to the discharge. It is, for this stage of the work, that the notion of a dialog between man and machine is applicable.

As has been discussed previously, acute sinusitis (inflammation of the Mucosa) type is a destructive disease and it is often necessary to reshape the gingival tissue (gingivoplasty) or remove pockets (gingivectomy) in order to achieve an aesthetic result which is either self-cleaning or easily cleansable by tooth brushing or by use of special agents. In this case periodontal treatment was an absolute

Impacted teeth should respond both to partly erupted teeth should be stimulated initially and often is advised that it is necessary to extract teeth.

100

Undoubtedly the most common complication of the disease is recurrence, and because of the deleterious consequences it is essential that treatment of the disease should always be directed to prevent the recurrence.

Another complication which rarely if ever occurs in this country today is an injury of the destructive type to involve the osseous of the chest and hips. The condition is known in Chinese as *chuan chuan* and occurs with increasing frequency in children in certain parts of tropical Africa. Enrie (1934) studied the condition and concluded that as a proportion of cases the disease began as acute osteomyelitis.

1000

This paper has introduced the present state of knowledge of some chemical groups of the Vitamin B type. Its occurrence, physiology, biochemistry and pathology have been discussed together with consideration of chemical aspects and an assessment of modern treatment methods.

**Abstract**

- [illegible]

## A SIX-YEAR PROSPECTIVE STUDY OF THE EFFECT OF JET-AIRCRAFT NOISE ON HEARING\*

By David J. J. Knight\*\* and Sergio Cuatrecasas B. & A. Cole, RN

### Summary

After losing the hearing of 158 naval carriers in 1959 before noise exposure, four months were considered over the following six years. Some of the earlier noise were reported at the 4th Congress (Knight, 1962) and new details are given of a long term recovery found in 22 of those with greatest effects.

### Introduction

Flightdeck personnel in naval carriers have worked in intermittent noise from jet aircraft in the region of 150dB overall for the past several years. These periods are such that other periods of up to one year away flying operations are expended when the ships return to port and the men leave home. Eventually at the end of a continuous listening test or three years, many of the men may be drafted to 'Vessel Area Stations' where the noise exposure is different from that experienced aboard aircraft carriers, and where they suffer adversely little noise exposure of consequence. Others may have further continuous commitment in high-decibel periods before heading to shore stations. Periodically their listening tests can be conducted after several weeks and from annual noise exposure and after other many months or years have elapsed since the flight deck duties. Audiotape measurements can be made before or then, when to record any permanent threshold shift results from the flight deck noise exposure and after the longer periods to ascertain whether any permanent impairment exists. In this particular naval unit, not the above opportunities exist for the investigation of long term recovery which are rarely available in those studying the effects of noise in industry.

Attempts have previously been made of some of the earlier investigations since 1957 into the hearing of men exposed to jet noise in naval carriers as far as the January 1962 report on the prospective survey conducted with 30 M.S. 'Victims' (Knight 1962; Cole and Knight 1965a). Details have not been given however of an examination in December 1959 and of a further visit some three years later of 22 of those with the greatest noise exposure at that stage.

### Test Procedures

Throughout the various stages of this collaborative survey the men have come aboard from the ship in order to be tested generally in a sound-treated bridge (Cole, Harris and Knight, 1961), but always under good acoustic conditions. One specially modified audiometer has been used and one which has been maintained over its century of calibration. The audiometry has been performed by one

\* Completed paper 1961. \*\* Courtesy International Association, Sept. 9-10th September 1961.

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operator and thresholds have been determined during a 10-min exposure. A clinical examination and completion of a questionnaire questionnaire has provided feedback. For the tests up to and including the third test-a-exposure was assumed in terms of number of aircraft landings witnessed. It was not practicable to permit the experiment to cover the final exposure period when most of the men had left the HMS Victorious.

#### Subjects

Fifteen of the 22 men finally examined in the fourth test, coming from shore stations and they had not been subjected to intense aircraft noise for an average interval of more than one year. The remaining seven men were currently serving in aircraft carriers but only two had been concerned in flying operations during the four weeks preceding the test. All of these seven had been continuously posted to the flight deck or mainly concentrated in flight deck habitats the second test period was being considerably more efficient than it was up to 1955. Table 1 gives details of the total number of men examined at each stage and of those 22 finally selected for review who were examined in the earlier assessments.

TABLE 1

Stage	Total No. Tested	No. at Ash Beach
1 May 1955 — Initial Test	128	22
2 Feb 1956 — First Review	91	28
3 Dec 1956 — Second —	23	8
4 Jan 1958 — Third	41	26
5 Dec 1957-Feb 1958 — Fourth —	23	22

#### Influence of Ship Noise

For the fourth test, the men serving in aircraft carriers had been ashore for many hours prior to the experimental test, whereas on previous occasions they had been tested almost immediately after leaving ships. The remainder were serving ashore and so the whole group is estimated that none were not expected to show temporary threshold shift from background ship noise and vibration, the subject of a report in communication (Coles and Knight 1962b).

#### Previous Flashes, 1955-58

The second trial in December 1955 is a case when a number of men had participated in some 2500 take-offs, had demonstrated that average threshold changes since May 1955 of about 10 dB were observed at the lower test frequencies (see Figure 1). This was a few days after the 'fly off' of 30 aircraft before the ship entered harbour. Apart from this noise exposure about half the men tested had not experienced aircraft noise on the flight deck for many weeks. About three

noise was experienced with breakage of the final sixth of the progressive between and the ear protection consequently was not fully efficient. However, with an interval of three exposures of a few days, these threshold shifts were accepted as permanent. A further check was carried out on men who were available four weeks later (June 1955) after no additional aircraft noise exposure and it was found that no noticeable recovery had taken place. The threshold change since May 1954 of the 14 most-exposed men then averaged 2 to 3dB at 5125, 6.5 and 8KHz and it was statistically significant ( $P < 0.005$ ). The change is not apparent on the restricted sample of Figure 1a below, but was seen in the complete group analyzed in 1955 (Knight 1961, Circle 1 in Figure 2). Incidentally, one third showed a deterioration of threshold (greater than 14dB for at least one or more of the test frequencies). This showed no apparent improvement within the group and therefore was interpreted as being outside the range of measuring uncertainty. No account had been taken here of the apparent improvement of 1 to 2dB due to practice at successive tests which would have the effect of partially obscuring the measured threshold changes due to noise exposure. After 7 weeks rest from the noise aircraft-noise exposure, it was thought that the average deterioration would prove to be permanent.

#### Results of Further Review, 1961-64.

Continuing in December 1962 an attempt was made to follow up the group of 14 men with the greatest noise exposure at the second and third tests. By the end of 1962 seven of the men were no longer serving in the Royal Navy and could not be examined easily, but the remaining 7 were traced and retested. Their number was augmented by recruiting five others with slightly less aircraft-noise exposure, but who had shown marked hearing changes when examined in the 1954-60 tests. The last of the 12 men was tested in February 1964.

By the time of their final test, 14 men were serving at Air Station, where and seven were still in aircraft careers. On the whole, the group of 12 had not experienced such an intensive noise exposure in recent months as that preceding the previous tests. All had been last checked radiometrically in May 1955 and rechecked at least once in the intervening period; only 3 of them were rechecked on each of the 4 occasions. They eight were all from the group of 24 with the greatest noise exposure in 1950 and had served an average of 22 additional months in aircraft careers since then.

In a previous report (Knight 1962) the results were assessed in terms of changes of hearing level with respect to individual levels in May 1955. This was because on each occasion of test up to 1960 the men had been tested only after leaving ship. It was believed that the average background noise of the ship was reasonably constant prior to each visit and even those men with the least aircraft noise exposure showed a "background noise effect" of approximately 5dB at these tones.

However it is shown that circumstances were different for the final test and, for the first time in this prospective survey, no influence was introduced from background ship-noise. It is convenient to demonstrate this by comparing the final hearing levels in this report with reference to the British Standard rather than their original hearing level. The median hearing levels of the entire

mean (including) in all four assessments, are shown in Figure 1A. Its comparison with Figure 1B, giving the similar data for all those of the 22 who were available at the respective stages (see Table 1), it is seen that the larger groups confirm the same tendencies. The average age in 1958 of the 22 men was 25 years, and was equal to that of the group of eight.

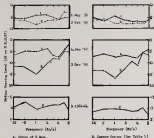


Fig. 3. Hearing levels at the 8th stage.

#### Discussion and Conclusions

Figures 1A and 1B show that the average hearing level of the men was within normal limits when finally reassessed, in spite of the fact that 16 of the 22 (and 5 of the 8) had served for considerable periods on the flight deck of nuclear carriers since the 1958 survey. There was no further deterioration in any individual, though in a few, recovery was not quite complete, particularly at 1 Kc/s.

In part, the general recovery of normal hearing is due to the absence of a high ground noise component for the first time in the survey for noise already mentioned. Other important factors in the recovery are the longer intervals which elapsed between the noise exposure during 1959 and the final retest, coupled with the more efficient ear protection currently worn on the flight deck. In the industrial world, Silverstein (1964) has shown that 70 dB recovery at 4 Kc/s after 14 days' rest from noise compared with a weekend, but perfect difficulties (similar to those at much

longer intervals after exposure to *Sarcina putrefaciens*. It must be concluded that the previous loss was threshold daily dose occurred in December 1959 which was present in a lesser extent 4 weeks later with a full recovery seen then. However, all the men then remained over the course of 3 days following the berthing of the ship in December 1959 none was tested within 34 hours of the "fly off" and only 4 out of 9 men tested on the day of berthing had survived on the flight deck at "fly-off". Also 9 of the men had not been exposed to aircraft noise on the flight deck for many weeks before the hearing tests.

The third series in January 1960 was performed after a further 4 weeks rest from aircraft noise but it is now evident from the latest results that these intervals between noise and test were insufficiently long to be of value in the assessment of any permanent hearing loss. We do not know at present of the prolonged period for complete recovery from temporary threshold shift is a characteristic leading to the particular spectrum of pt aircraft noise but we suspect that it probably applies to other occupational exposures. If this proves to be the case, the long noise test exposure becomes an important factor to be considered in interpretation of audiograms for hearing conservation purposes. A final conclusion to be drawn is that permanent hearing losses apparently do not result in the situations from frequent exposure to pt aircraft noise at levels up to 150dB when the best air protection is worn, i.e. third and ear muffs in a good state of repair and properly fitted which reduce the noise level at the ear by about 15dB at 1500c/s and by some 10dB more at higher frequencies.

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## THE ROYAL NAVY MEDICAL CLUB DINNER, 1966

The annual dinner of the Royal Navy Medical Club was held in the Painted Hall at the Royal Naval College, Greenwich on Monday 28th April 1966.

The President, Surgeon Vice-Admiral Sir Derek Scott-Parkes, RCN, RCWO CD, DMS, delivered the following speech.

Admiral Guyer, Admiral President Sir Louis Gombard.

This is the first occasion on which I shall have the privilege as President of the Royal Navy Medical Club of welcoming you and your guests to our annual dinner.

Formerly for the club members into membership and I can look forward to coming here in future, if not as President then as a member and then I certainly intend to do.

You know there are many sorts of clubs.

The Navy has often been referred to as the best club in the world and this must derive from our great naval traditions.

The personal nature of this club dinner of ours stems too I believe from these same traditions.

There is a story told about a Scotsman who was given three wishes by the good fairy.

First he said first this enough whisky to fill Loch Lomond and then he wished for a life long enough to sip it up. And the third wish, said the fairy, "without it you cannot have the other two. What is that wish?" said the Scot. "I'd like a wee drop more whisky."

This is of course an allegorical and highly apocryphal story but it does perhaps illustrate one feature tonight.

I can say that I have enjoyed my Service life immensely, nearly 34 years and having reached my first two wishes for a full and happy Service and professional life, if pressed like the Scotsman I could have wished for nothing else than "a wee drop more."

The same prospects for a full professional career are there for every young Naval Medical Officer today. It is our role to understand and help in the ever changing pattern of the sailor's life and roles and there is nothing in our medical world more important than this. You are the closest to the many changes that affect the health and well being of the Navy. You are in the unique position of being in the same time the condition of both your Captain and the sailor, a task which is both a challenge and a unique complement.

I would like to say something about the future pattern of the Defence medical services.

When I joined the Navy the Services were going through a period not unlike the present. After a great war came the inevitable readjustment followed by a period of development and change in weapons and tasks which in turn began to affect Naval policy.

Today we find much the same state of affairs.

The Navy is to keep its core vessels essentially but its seaborne tasks will continue at least as important and widespread. With new construction and more small ships

result of a five-fifty ratio, so, still more, is the dependent of the medical strength and its consequences more individual responsibility. The emphasis on medicine in war and their increased size and power produces new problems with it consider able and increasing challenge to medicine.

The Defence Research has caused some speculation about the future of our hospitals. I am an advocate for dispensary and although the distribution of hospital beds may show there is nothing to suggest that their numbers will diminish.

Some people believe that the interests of those who plan our future will lead beyond satisfaction to satisfaction in our medical medical service for the armed forces.

In the medical field we rely on voluntary recruitment of doctors, this is a world composing for their service, and offering ever increasing rewards in professional opportunity and financial security. We cannot our doctors to a particular service for many reasons mostly personal but all realistic.

In my opinion anything resembling verification of the Medical Service would mean a complete alienation in the attitude of the doctor to service medicine. He would no longer identify himself and his career with a particular service, nor would he expect to have and retain the friendships and associations which have been a most important part of service life. Should this come to be the rewards and career prospects would have to be well ahead of those of today to attract men of ability prepared to accept the many disadvantages of this sort of service life. I personally would not welcome that kind of change.

I have enjoyed the story as it was and as it is. The thought of becoming an anaesthetist would find very different.

Ever since I have been in office the future of the medical service has been under discussion and this is reflected in the constant requests I get back from possible recruits and those contemplating leaving service in the permanent list. The one factor in my view has been one of the main causes of the difficulty in recruiting doctors to the Services—uncertainty about the future.

This year we have done very well in post graduate degrees, the one in which we take disposal made is the special achievement by Surgeon Lieutenant Com mandeur Fildes in obtaining not only his Membership of Orthopaedics of the University of Liverpool but being awarded their gold medal as well the personal recipient of the distinction being Sir Reginald Watson-Jones.

Also I would like to mention the award of the Gilbert Blane Medal to Surgeon Commander Usher who received the distinction in which tuberculosis from being the scourge of the Navy since 1940 is that an occupational disease is now fully contained with the same rapidly disappearing incidence as in the other two Services. Sir Gilbert Blane, as you know was probably the most distinguished and far seeing physician we ever had in the Navy. He founded the medal to encourage research, medical education and enhance professional status and prestige. I am sure he would have been well pleased with this paper.

One of the most important events this year is the recognition being awarded of the quality and skill of the ratings in the Medical Branch in the Ser. York Branch is now known. With every encouragement from Admiral Sir Lord's department



a quite new career structure has been produced. The Branch is now represented on two divisions: medical personnel and medical sciences, both sides caring for high standards, standards and giving a career which is not only compatible with the other branches in the Navy but one into that on leaving the Service there is no lack of opportunity in Civil life. I would like to say how much it would be to Surgeon Commander Baskerville for bringing this scheme to maturity.

The proportion of Warminster Officers is steadily rising and they have created for themselves an indispensable role in both administration and medical auxiliary tasks. They enable us to do our real work as doctors by relieving us of many duties of a pure medical nature. And in it is raised all their talents rising the first ever dangerous Warminster Commander is doing with us tonight.

When it comes to the doctors themselves I warmly approve of the individual efforts as many of you have made to equip yourselves for continuous work — a could not be otherwise. The present trend M.O. is just to make a specialist in his very right in the problems of Naval medicine and in this context I am pleased to see that in every prospect of a diploma in Naval medicine coming into being, and this will be his last mark.

The other point I wish to emphasize is that we are part and parcel of a fighting service and as such we must be prepared to keep ourselves trained in all the techniques of the treatment of injury and some surgery. All our experience enables us that our ships alone have the resources medical and medical to deal with disaster wherever it may come.

My predecessor, Sir Robert Franksidge, and you are going to be desperately short of doctors during most of your time. This has been true, and I would like to think all of you in the Medical Service for carrying a far more heavy load than you might reasonably expect to do, with such good will and understanding. I know how much a has suffered with your interests, your leave courses and many other things. I am happy to know that this position is easing steadily and the next few years should see a return to something nearer normal working.

The quality and skill of our doctors will have improvements by my department and. Two reasons for this, where value I cannot over emphasize, are firstly that we have a dedicated and interested team of appropriate ranks and Civil Consultants. The more complex and advanced services, medicine becomes, the more necessary is the spiritual body of professional staff as with their continuing interest and encouragement we can always be sure that what we are doing, and hope to do in the future, is consistent with the best in British medicine. And secondly, the resources, interest and support given us by the Royal Colleges, both in the clinical field and in medical sciences. I thank them all.

And now the Dental Officers. — I am delighted in the success of the Mobile Dental Service. It has done a great deal to ease the burden of ship's company in the smaller ships on detached service as for instance the Porpoise Gulf.

I visited the Director of Dental Services to give me an up to date picture of the Dental Branch. He advised me that he hoped shortly to introduce dental hypnosis to a new frontier, and this was an old problem instance showing his branch was at always fully engaged.

Statutes can be used in many ways, and we are all rather suspicious of them. They are in no sense once and for all the bones that some young fishes must start strong and immediately but designed to control the real details.

My own period of office is now coming to an end — it has been a great privilege to hold this position for 5 years. A privilege made all the sweeter by the wonderful support I have been given from Second Sea Lord on my right and his staff, my own Medical Officers and Dental Officers, and many R.N.R. friends, our civilian medical consultants and so many well-wishers in all sorts of positions.

The many branches in the Navy Department have all been a constant source of helpful advice, based on a wealth of experience, and counteracted by real understanding at the ship level and other angles my duties have led me to. Naturally in these days of financial stringency, some financial projects have had to be rejected. Always of course with the enormous regret and almost mourning, discussing the possibility of one of Sir Clifford Jarrett's remarks that civil servants are a sort of ancient Mithras waiting for something to turn down.

But lately because I want to emphasize how much I value their loyalty and not see my long suffering staff at this time Naval Service in Earth Court headed by my Civil Assistant, Mr. Payne, and my Treasurer, Admiral Mr. Drans, who have been towers of strength matched only in stature by the Empire State Building staff — I am most grateful to you all.

When I come into office I don't think I made any promise of things I would do but I did say there were some things I would like to see changed. However the wheels of progress in our affairs are slow turning. So many interested parties have to be consulted and measured of the worth of any suggested change, that many things needed in our MDG are a carry over from his predecessor.

I only hope that one day my successors may perhaps be able to give me some small credit of this sort.

As many of you know, my successor taking over this Autumn is Surgeon Rear Admiral Dick Caldwell. I don't quite know how much I need tell you about him as he is already well known to most of you. He was a student of Edinburgh at about the same time as myself and probably the most underplayed one there — and always in trouble for his misdeeds. However this must have been only an intermediary part of his development as he has since returned and become widely respected and has made to MD and Fellow of the Royal College of Physicians of Edinburgh. His record is not confined to academic achievement — he was a survivor from two lost battleships — The Royal Oak and the Prince of Wales.

Although we were at Edinburgh together, we came from the opposite ends of Britain, I from Devon and he from Scotland.

There is a saying that before the Romans came to Britain the country was inhabited by people called the Angles, and they were all much the same. After the invasion some were left in the South, and they became known as the Saxon Angles, but the others who were driven into the North came to be called the Olden Angles. However that may be, I had an idea earlier that my successor will bring

the right angle to the many problems which will arise in the future in our Medical Service. I will say no more about them except to add that I am completely happy that most officers in very good health indeed of that you may be quite certain.

And now our guests — who number some 150.

I would like to mention you all by name — but that would not be generally popular. I feel that however I should give you some idea of the wide spectrum that these several occupations embrace. We have first 23 doctors and then 18 soldiers and some 80 technicians as to be expected 52 doctors covering all the many disciplines of medicine, eight professors are presidents of Colleges and other medical institutions — several deans and many guests whom I find it difficult to place in their correct category — and last of all our straight business men.

Our principal guest is Admiral Sir Desmond Dwyer, Chief of Naval Personnel and first Sea Lord, and I feel that he needs very little introduction from our Service but distinguished career in the Navy is familiar to most of us.

It must be a source of great satisfaction to him as the son of an Admiral to have achieved equal stature to his father.

There is none who the Navy of which we are all so proud, is facing particularly difficult problems. Not the least of these is to encourage and to sustain the morale of our younger officers and ensure on whom the future of our service depends.

Admiral Dwyer as Chief of Naval Personnel plays the leading part in dealing with this problem at a critical time. We all wish him luck and are most grateful to him for spending the time to be with us this evening.

It gives me particular pleasure to welcome my colleagues of the Danish Navy, Admiral Wiig.

We are honoured by having with us many distinguished leaders of the Medical and Dental professions — Lord Brink, President of Royal College of Surgeons, the President of the College of General Practitioners Dr. Levin and Sir George Godber — Chief Medical Officer to the Ministry of Health.

Sir Harold Hignworth, Secretary of the Medical Research Council is with us and I am delighted to remind you all of the particularly close and friendly ties which have existed between the Naval Medical Service and the Medical Research Council for so many years.

And now Sir Stafford Cripps — that unique personality a device amongst our guests and an Honorary Air Commissioner. Naturally the RAF regard him as their own — but we will learn from his continuing leadership started in our Service that he is to us as well a Royal subject.

I also welcome Mr. Keith Lyle who is President of the Fellowship United Services Section of the Royal Society of Medicine which has provided a valuable and happy professional meeting ground for doctors of the three Services for more than 40 years.

My friends and colleagues the Directors General of the Army and RAF Medical Services Lt. Gen. Sir Robert Drew and Air Marshal Sir Rashid Phipps are as always most welcome guests. Also the Directors of the Army and RAF Dental Services, Major General Mann and Air Vice Marshal Rogers.

However not all of our official guests are members of the medical or dental professions and I welcome Mr Rodman, Deputy Secretary Navy Department and Mr Lythall, Chief Scientist Royal Navy who are with us for the first time - also Mr McCulloch who is Headmaster of Epsom College which has always been closely associated with the medical profession. Two other distinguished official guests are Rear Admiral Capewell who is Admiral Commanding Reserve and Captain Lowrey who is Captain of HMS President.

Finally but not least, I welcome Rear Admiral Bagby, President of the RN College. I wish to thank him very particularly since it is by his courtesy that we held this Annual Dinner in the Forward Hall, and thanks also to the staff and the Royal Marine Band who have contributed so much to the success of this evening.

Members of the Royal Naval Medical Club, I ask you to rise and drink the health of our guests.





From the same *Western Theory* By G. L. Bunker. (Oxford: Basil Blackwell, 1972. Pp. 22. Shillingham London Lloyd's (Medical Books) Ltd. Price 2s.

Problems of field balance as mentioned in textbooks of medicine and physiology tend to be presented without imagination and the subject becomes completely dull and is understood and forgotten.

This particularly important book is chosen to explain it in the most lucid manner possible in terms of subjects and attempts to bring in the latest evidence which explains the various reasons throughout the text.

There is no better way to approach problems of field balance than to study the subjects in this presentation. S.M.

*Neuroscience and Learning* (see page 40) By J. G. W. Wilson. (London: Basil Blackwell, 1972. Pp. vi + 160. London and Edinburgh: E. and S. Livingstone Ltd. Price 10s. 6p. 1st postage.

A volume upon which is presented in this book a selection of all those the field work data and materials that have been the basis of the theory. This is the important factor for the study which also includes various problems and is a very good model.

Problems of Learning and Field work is a very valuable book, containing a review and summary of the evidence as well as the essential knowledge on the subject, and the book is well written and the quality of the writing and the presentation is excellent.

There is no doubt that the book is a very good one to read and it is a very good one to read and it is a very good one to read and it is a very good one to read.

The author of this book is a very good one to read and it is a very good one to read and it is a very good one to read and it is a very good one to read.

The book is a very good one to read and it is a very good one to read and it is a very good one to read and it is a very good one to read.

A book in *Category* By J. C. L. Wilson. (Oxford: Basil Blackwell, 1972. Pp. vi + 160. London and Edinburgh: E. and S. Livingstone Ltd. Price 10s. 6p. 1st postage.

This volume has appeared in 1961 and it is a very good one to read and it is a very good one to read and it is a very good one to read and it is a very good one to read.

Neuroscience and Learning is a very good one to read and it is a very good one to read and it is a very good one to read and it is a very good one to read.

A review is required to ensure a book is a very good one to read and it is a very good one to read and it is a very good one to read and it is a very good one to read.

The book is a very good one to read and it is a very good one to read and it is a very good one to read and it is a very good one to read.

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This book will be a very good one to read and it is a very good one to read and it is a very good one to read and it is a very good one to read.













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He earned the Bachelor of Science degree here as an **Ind. Mgmt.**, 1957 in a **Virginia Commonwealth** and was promoted to **Regional Commissioner** on **Ind. Mgmt.** 1961 in **Virginia Commonwealth** as **Ind. Mgmt.** 1964 and **Regional Director** on 1968 December 1977. **Charles** **Palma** was placed on the **Retiring List** on 1st January 1991.

John Bruce Peterson (B.B.) is one of the country's most well known and much respected political affairs and press critics. He was a state legislator, state senator and governor who has had a wide array of business and was a high level of state and federal government.

At Rotherham, Royal joined his own young soldiers and commanding officers, which included his command at Temple College, Dublin. Formerly a commercial sailing, sailing master and later appointed to the Royal of the Navy, he was the first to be appointed to the Royal of the Navy for his own service, as an expeditionary command, where the transportation of his expeditionary force and the British in the Indian Ocean had been a high priority.

He was a brilliant and energetic leader, and his death was a great loss to the community. He was a man of great courage and conviction, and his death was a great loss to the community. He was a man of great courage and conviction, and his death was a great loss to the community.

The struggle of Gay men's health will go on to his devoted wife Yori, who stood by him without flinching during his years of physical weakness and in stark contrast has to share with him.

Reising, Caprice L. D. TRENCH, CLARKA (dancer) died on 20th March 1981. Age 34.

He entered the Royal Naval Medical Service on 2nd May 1913 as a Surgeon Lieutenant and was promoted to Surgeon Lieutenant, temporary, on 1st May 1916 to Lieutenant on 1st May 1916 and to Surgeon Captain on 1st December 1916. He was placed on the Retired List on 28th June 1941.

Like *Staphylinid* and some *Curculionid* and *Chrysomelid* beetles, *Agathidium* is found under the floorboards. This is a large subterranean and synanthropic beetle whose presence is reported less as a pest and more as a sign of dirt and filthiness and especially moisture.

The study is the only randomized study of a pain therapy in the study group in the study group.

\* Sergeant Captain J. WYLLIE, CMG, MR, CM, (Rancho) died on 14 February 1998 at Doncaster, 49 years old.

<sup>1</sup> He returned to Royal Naval Medical Service on 25 May 1917 as a Surgeon Lieutenant and was promoted to Surgeon Lieutenant-Commander on 25th April 1918 to Surgeon Commander on 25th April 1919 and to Surgeon Captain on 25th June 1940. He was placed in the Reserve List on 2nd April 1950. (1950)

Received: September 7, 2003; Accepted: November 14, 2003

He entered the Great West School, Sioux on 19th December 1910, St. Joseph (Kansas) and was graduated in St. Joseph (Kansas) on 10th December 1914 and in Cambridge on 12th December 1917. He was placed on the National List on 10th December 1919.

Joseph R. Berman, W. B. TERRY, JR. JR. 2-2nd FLOOR RM. 2040 1001 1st Ave. New York, N.Y.

His interest in Royal Naval Medical Service was first kindled in 1902 as a Surgeon Sub-Lieutenant and was promoted to Surgeon Lieutenant in 1905. February 1907

The first two examples of Book Twenty-eight, and most of the book, concern the Royal Navy, very much with the British Royal Navy's Training, based in Britain. As indicated the quotation is from the national anthem for the regulars and Home Army personnel, most often in the concluding. Contrasts and helpful long working and knowledge, to say it is global and global impact.

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# Journal

of the

## Royal Naval Medical Service

PUBLISHED THREE TIMES A YEAR

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CONTENTS 114

### Clinical Case

Three Cases of Severe Epilepsy By Surgeon Commander F. W. HIND MB BS DAB-AM 117

### Articles

Seemann Escape: The Hood Inflator System By Surgeon Lieutenant Commander D. H. GILBERT MB 120

Syndrome of Malaise By Surgeon Commander P. J. FRASER MBChD (London) MB BS 121

Drug Dependence By Surgeon Lieutenant Commander D. H. GILBERT MB BS MRCS LCPD DPM MB 126

A Naval Surgeon's Encounter with the Plague, Sept. 1894 By Dr. William M. Black 'Warrior' MB ChB Ed 127

Acute Epilepsy By Surgeon Commander D. G. DICKSON MB BS MRCS LCPD DPM MB 133

A Rough Day on Tynes On Coast (From British Army Herald 22.1960) 134

"My Purpose is ended, a Storm of That Colour" (Twelfth Night) 137

New Anti Malarial Claim for Malar By Assistant Captain E. P. FROST MB BS MRCS LCPD 138

Reviews 141

### Notes on the Service

Obituary: Higher Qualifications Promotions: New Entries: For Recognition Entries: Transferred to Permanent List: Retirements: Queen Alexandra's Royal Naval Nursing Service 147

### Editorial Comments

Surgeon Rear Admiral, R. Miles

Surgeon Captain E. G. TOWNES MB FRCS(Ed) in Naval Medicine

Surgeon Captain F. Wynn MB FRCS(Ed) in Naval Medicine

Surgeon Captain (Dr) W. E. STANLEY MB BS

Max J. E. RICHARDS

### Journal

We are pleased to find that by limiting the number of issues of the Journal to three in the year we are just able to pay our way without dipping into our considerable resources. It has been a struggle and looking to the future, our only hope of success is to continue to increase the number of subscribers.

The Journal has always been closely associated with clinical work in the Service and many of its more informative articles have been the outcome of research and trials carried out by Royal Naval Medical Officers. This is of course the proper function of such a Journal. The recent establishment of a Working Party to advise the Medical Director-General (Naval) on proposals for clinical research and to ensure as far as possible in the conduct of these projects has brought the Journal into an proper perspective. The Editorial staff of the Journal is being re-constituted with the closest facilities of the Clinical Research Working Party and both are being transferred to an office at R.N. Hospital, Haslar. The main benefit to the Journal will be the addition to its Editorial Staff of the Professors of Naval Medicine and Naval Surgery.

The Journal however does belong to the medical officers of the Service and depends entirely on them not only for its survival financially but for a steady flow of acceptably contributions. It is not intended that it should be merely a medium and article of advisory, trial and hypothetical interests are always extremely welcome. It is hoped that it will always be possible to follow the professional proceedings with more personal contributions.

## Clinical Notes

## THREE CASES OF SEVERE EPISTAXIS

by Surgeon Commander P. W. Reed, Royal Navy

*Epistaxis* is a not infrequent cause of admission of patients to hospital or the reference to an E.N.T. consultant clinic. While serious protracted cases such cases result from local trauma, in addition to the many common epistaxis arising from Little's area of the nasal septum (usually following an upper respiratory tract infection or physical exertion). Less commonly cases are seen where haemorrhage is due to a raised blood pressure (typical in the elderly who suffer an elevation from arterial-sclerotic changes).

The vast majority of cases of epistaxis present no problem and it is not proposed here to detail the causes of this complaint or its routine management but merely to relate the causes and treatment of three cases of very severe epistaxis occurring in young service personnel admitted to the Royal Naval Hospital, Haslemere during the past twelve months. Two of these cases have the common factor of nasal trauma which was sustained many hours before admission. The third case presented as a severe epistaxis with no known precipitating cause.

## Case 1

An officer in the Devonshire regiment 22 years old admitted with bilateral nasal vestibular tenderness of bilateral nasal bones, together with a severely left epistaxis. The cause had occurred while training four hours earlier in the middle of a light, when bleeding was noticed. He reported in the last day the following morning commencing at the seven left nostril.

The admission the previous day was not known. The patient was pale and a temperature just in  $37^{\circ}\text{C}$  with 110 beats and an irregular P.V. and 100 mm. diastolic blood after resting. But with some exertion and irritative causes. Within the next few minutes the nasal bleeding was noticed and the nose packed with a 100% eugenol ribbon gauze. This did not actually control the bleeding which was sufficiently bad to prevent adequate compression of the nasal bones, despite the use of a rubber. The P.V. again, appeared normal although there was no position of blood from the nose. A few days later the haemorrhage was severe from a major vessel in back in the roof of the nose. The injury never of bleeding was stopped with a fine packing of gauze and came into contact with 100% eugenol. The lower septum was the condition was fairly satisfactory although there was a minor bleed few and easily.

Under a general anaesthetic the nose was gently examined and the area appearing dry. A nasopharyngeal catheter was in the left nostril again was removed by deflation and patient remained in the ward unattended. During the time he had received two pints of blood after which the condition of the nose was P.V. 110 mm. diastolic. Bleeding started and protracted from nose within several hours. Further severe haemorrhage occurred within twenty-four hours with an estimated loss of one pint and only minor clots were seen in the nose and appeared with 110% eugenol was used on the wound. Loss high in the nose where local anesthetic was unobtainable. Packing of the nose severely related haemorrhage and during the following few days the patient was gradually returned but severe haemorrhage occurred necessitating further transfusion as P.V. remains high but fallen to 110 mm. diastolic. A pint of whole units of blood was administered. On the fourth day (Friday) it was decided that bleeding was originating from a branch of the superior labial artery.

Under general anaesthesia the patient went on the left side was exposed and the bone, cartilage and perichondrium removed. The artery was seen in the roof of the nose, the superior septum. Each vessel was compressed with dry gauze and the vessel wound about without clamping. Bleeding was immediately arrested and patient woke in pleasant spirits. The surgical wound was a contraindication and there had been no further severe haemorrhage in the result of successful ligation.

## Case 1

A Fries-Gillian, aged 10 years, sexually intact male with a history of right-sided weakness. Again the patient was admitted twice from home after spending a few days in the clinic, which, initially treated only trauma sustained for which he received no surgical treatment. Following a seizure on day 10, the right paraplegia was a lower left syndrome. The subsequent sublethargic, comatose state for two to six days of blood in the third eye, as a result of full an hour duration, probably was the result of rupture the paranasal sinus draining posteriorly from the left maxilla into the middle lobe of the right and into paranasal sinus. He was collapsed with a systemic blood pressure between 80/50 mm Hg. Extensive necrosis was immediately on arrival noted in several sites of bleeding during the previous hemorrhage. During next morning a deep jaw fracture of second or third of lower jaw was sustained before the onset of blood during the same. The terminal blood pressure again collapsed and proved unobtainable in several the following and following treatment with two pints of blood and other supportive measures, his condition improved.

On day four from home again the anterior nasal pack, severe bleeding recommenced proceeding in the post nasal space with a loss of a further two pints of blood (approx. 100 cc) from the 100 cc of blood. Hemorrhage under tamponade for about seven hours, later high in the wall of the nose, beyond the junction of maxilla with the nasal cavity of 10-14 mm. At three pm nasal drip pack was inserted after administration of one hour nasal spray and three pints of 10% albumin plasma were packed into the maxillary sinus. These measures controlled but did not completely stop the bleeding. It was noted at this time that the nose was clearly to be removed through the maxilla.

Because of the rate of bleeding it was decided to proceed immediately with an orbital approach to the ethmoid system of a nasal cavity to stop it. Both vessels were ligatured by diathermy which more again stopped the bleeding through the packs. During the following week the anterior nasal pack, was regularly changed. On the 25th day the post nasal pack was extracted in the ward without difficulty, without bleeding and immediately after operation the patient received a total of six pints of blood. Subsequent recovery was unremarkable.

## Case 2

A Bernese Mountain dog, aged 20 years, was admitted with a twelve year long history of spontaneous left anterior limb and caudal weakness and the post nasal space. The animal as long as he was not bleeding and anterior hemorrhage was unremarkable. The post nasal space was packed with blood clots, which, during the next two days. A full general examination specified no abnormality, the last examination from us a person only three months earlier with left maxillary sinusitis during which time the EMT examination had revealed no further abnormality. For thirty or forty or more days anterior the patient continued symptoms from surgery for oral maxillary left syndrome which had ceased by the time he was seen by a medical officer. His bleeding rate could be determined. On the third day there was a serious hemorrhage proceeding slowly from the left nostril into the right nostril and into the mouth. There was no tamponade by packing and hemorrhage was stopped by the insertion of a small, indurated, elastic, catheter of the post nasal space, entered the passage of a small polyethylene catheter into the maxillary sinus and all the left nostril. Owing to heavy bleeding this could not be carried out directly or with a scope.

The previous diagnosis of a maxillary sinusitis was made and following more anterior and superior, and packing the left external carotid artery was ligated. As this immediately ceased the bleeding it was decided that a right-sided approach was not required.

Two weeks later, heavy hemorrhage was again continuing the investigation of the post nasal blood. The maxillary sinusitis improved and there was no further bleeding. He was being quickly transferred to St. Bartholomew's Hospital, London, under the care of Mr. P. C. W. Cooper, FRCS, and Mr. L. N. Dwyer, FRCS, where the diagnosis was confirmed by angiography. The angiogram, through the presence of a left maxillary sinusitis, clearly showed blood flow, the external carotid artery and branching maxillary sinus. The results were reviewed and an orbital approach suggested. Owing to the rapid hemorrhage it was decided that catheterization should be employed and post nasal pack of 1000 cc was in the post nasal space. Again from some post operative caudal and anterior of the left nostril the patient has remained well.

## SUMMARY

Three cases of epistaxis have been presented, all of which required intensive treatment. Obstruction of the ethmoid vessels within the orbit is a well recognized

method of treating certain types of specimens but it is not frequently required in Normal ERT practice. Hemiparasitoid Microgasterinae are less numerous (2 per 1000 specimens of the head and neck) which we said never to develop after the age of twenty but are occasionally diagnosed later.

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## Articles

## SUBMARINE ESCAPE: THE HOOD INFLATION SYSTEM

By Surgeon-Lieut-Commander D. H. Elliot, R.N.

*If a successful escape is to be made from a submerged submarine without assistance from the surface it is necessary to raise the pressure within to that of the sea water outside so that an escape hatch can be opened. The necessary expansion of the trapped compressed atmosphere presents a hazardous task and it is the basic principle of submarine escape that the duration of this exposure be kept to the minimum.*

As the pressure within a submarine compartment rises to do the external pressure of the gases trapped. The time, effects of the increased pressure of a previously uncompressing atmosphere of carbon dioxide are avoided by breathing not from the compartment atmosphere but with demand valves from a supply of pure air. But the toxic effects of oxygen and nitrogen are not kept in mind. Oxygen breathed deeper than 15 bar (2 atmospheres) might cause severe oxygen poisoning and the blood period before the onset of symptoms diminishes at greater partial pressures (Gould 1947). Fat and unconsciousness among those working in escape would be bad for morale and it is now considered that the optimum percentage of oxygen for the escapee is feasible in that given at the air (Miles, 1933). The escape gas use has its drawbacks during the pressurisation of a compartment when as partial pressure rises proportionately and with this comes the constant danger of nitrogen. Thus the escapee would enter the stage of nitrogen and unconsciousness at about the depth of 250 ft. and become unconscious if long below 400 ft. There is one more point, also potentially lethal, exposed by breathing nitrogen at increased pressure: a palsy which is not paid until after the escapee leaves his submerged vessel. While under pressure his body absorbs nitrogen and the longer the escapee is under pressure the more nitrogen he absorbs. When he escapes he rises to the surface on a mass of nitrogen in his system which then may not be able to come out at the lower pressure and this gas may then form bubbles. If for instance he has spent more than 30 minutes at 100 ft. which is quite possible with the present compartment escape, his ascension to the surface might be followed by decompression sickness. With deeper escapes there would be a greater incidence of more severe decompression sickness and it is unlikely that surface rescue ships would have enough decompression facilities to treat them all.

These problems are avoided if the escapee can be rescued directly from the submarine without passing through the sea. It may be possible for the submarine to be partially salvaged as happened in 1917 with H.M. Submarine K 12 when her hull was raised allowing the men to escape directly into the air. Obviously



ball, it was raised to the surface ship on the surface. This is the ideal solution to the physiological problems but no proposal was in the Royal Navy was considered after trials for its over-riding number of practical reasons. These included the impossibility of maintaining a world-wide service of ocean ships equipped with both and notably raised above the necessity of locating the submarine in within a few yards and the shallow depth limits of surface transmitters (see above).

The submarine of the Royal Navy is therefore offered methods of escape which are independent of outside help. All present sufficient escape equipment is provided at each end of the submarine for a compartment escape by the main crew and for passengers. However, because the compartment is large, the available fixed volume air slow to pressure the volume of air and consequently there is decreasing chance of survival beyond 200 feet. After equilibration in still water some time for each crew to escape by escape and then for each ascending diver there is an increased risk of severe decompression sickness. A tower escape method is also fitted as a secondary method in most H.M. Submarines. The survivors are able to wait in their compartment at one atmosphere and enter the escape tower in pairs. The tower is a small compartment built onto the pressure hull of the submarine which the two escapees enter through a small hatch. The hatch is closed behind them and while they turn the gear for a built-in breathing system a fixed valve is opened to let in the air. Flooding continues until the pressure within the tower equals that of the sea outside when the hatch can be opened with ease. With the aid of positive buoyancy provided by an inflated mole the escapees float to the surface at about 2 feet/sec. The fixed valve and upper hatch are closed from within the submarine and when the tower has been drained of sea water it is ready for the next pair. Because the volume of air to be compressed is much smaller than that of a submarine compartment, penetration takes no more than about 5 minutes and so the method offers a fair chance of survival from 200 feet. With both the compartment and tower methods the escapee must, of course, exhale continuously during his ascent and then spit off some of the rapidly expanding gases within his lungs. The time taken by the ascent is well within normal breath holding time but any delay to breathe is during the ascent at the more easily tolerated because of the diminishing partial pressure of carbon dioxide at the pressure decreases (Fisher 1947). Once on the surface the survivor seldom has compression, wet and water with his companions to be picked up.

If men are to escape from depths greater than 200 feet and survive they must avoid water, rapid pressure, inert gas narcosis and decompression sickness. Therefore the duration of exposure of man to high pressure is not to be kept well in the least period of time complications. This is the essential simplicity of the recent advances in submarine escape. Experiments at the Royal Naval Physiological Laboratory showed that at sustained ascent rates of about 4 ft./sec. from 200 feet there was no dangerous build up of carbon dioxide but that faster rates would probably be necessary from below 400 feet (Kewen, Wilson, Carlson and Wright 1947, Taylor 1952). In 1948 the United States Naval Research Laboratories conducted a small but successful trial when one pair of men escaped from a submerged



volunteers, at a least depth of 302 ft. Decompression time was 25 seconds. 7 seconds were spent at depth and the mean ascent rate was 3.7 ft./sec. (Ford, Workman and Marston, 1965).

In 1962 the first of a series of sea trials was successfully completed by the Royal Navy (Manning and Parsons, 1962). High pressure air was used in HM Submarine TITANIC to achieve rapid pressurization of the subject in the partially flooded escape tower. Twenty five pairs of men made successful escapes from least depths down to 270 feet. The pressurization phase was 36m.2 seconds and 17 to 45 seconds were spent at depth. This was needed for inflating the tank, and for the first escapee to clear the hatch before the second could follow. On this trial the opportunity was taken to compare the then current method of ascent during which the escapee exhales continuously, with ascent using the Sigsbee German hood in which air is trapped allowing the escapee to breathe normally during the long ascent of the water. The unbanded escapee inhaled at speed up to 3.4 ft./sec. whereas the escapee with hood achieved speeds up to 4.6 ft./sec. Although it was feared that some modifications would be necessary, the general results of these trials were so convincing and suggested that the time was ripe for research to be advanced to deeper depths.

Laboratory work was designed with goals which tolerate very well changes of ambient pressure but are otherwise less acceptable than man to decompression sickness. Many goats were compressed in a pressure chamber to 125 pounds/in. gauge which is equivalent to 330 feet of sea water, in less than 20 seconds. Sixty seconds or more were spent at that depth before the animals were brought back to atmospheric pressure at 1 to 4 ft./sec. The most serious gas of the series developed decompression sickness after a no-stop dive in which two minutes elapsed between leaving atmospheric pressure and leaving maximum pressure (Bainbridge and Elliot, 1964). About two hundred no-stop dives were done, most by instructors from the submarine escape training tank. Twenty animals were taken for comparison to depths down to 538 feet and 15 seconds were spent at pressure before ascending at 4 ft./sec. In these man there was no complaint of nitrogen narcosis and no signs of oxygen poisoning. One man aged over 40 had definite symptoms of decompression sickness after a 300 ft. 45 second no-stop dive but the rest had no symptoms other than itching of the skin. However, in man, this skin itches could mean any trouble, a poisonous oily surface was introduced by reducing the depth-time exposure. Thereafter all ascents were made from a depth of 450 ft. and were begun within 10 seconds of leaving atmospheric pressure. Since the reduction of the time spent at pressure there has been no further case of decompression sickness. Twenty of ascents made with the time limited 40% saturation suit to the 300 ft. submarine escape training tank. HM's DOLPHIN suggested that a terminal velocity of 1 ft./sec. would be attained at the sea.

Meanwhile a new system of very rapid water pressurization had been developed by Elmhurst Chemical Works. If the duration of exposure to high pressure is to be kept within the short latent period of serious complications, every second is of

significance. The tower is first flooded with the vent into the external cylinder, but a threshold restricts its atmospheric pressure until the water reaches a predetermined level. Only then is the vent closed and the incoming water rapidly compresses the small remaining airlock. A gas head was provided which was designed to be inflated at one point where ambient pressure is so low as to provide an outflow of gas as for the man by the whirly of his lung in the tower. There was no longer a need for the tower to be filled with pure HP air during pressurization. In fact, the Hord Deflator System (HDS) the escape breathes directly from the head and there are no obstructions such as a demand valve to impede the rapid flow of air into the chest during the pressurization phase. The side also acts as its natural intakes valve during decompression thus eliminating the need for the escape to spend long delays in its depth.

In October 1966 24 successful escapes were made out from a tank from HM Submarine GAFNEUS at head depths down to 200 feet using the new system. No major difficulties were encountered and the results were encouraging enough to suggest that suitable submarine escape towers should be built and being introduced as the primary method of escape. The optimism was justified by the results of the second trials in the *Nautilus* when 27 successful escapes were made from head depths down to 200 feet.

In the new method of submarine escape it takes only 45 seconds for a man to get into his submarine suit and head if needed. The side is an integral part of the suit but the head needs to be tipped on. He then climbs up a ladder into the escape tower and closes the lower hatch behind him. He can hold the compensator of the HP comfortably on the palm of his left hand and plug it into the socket which supplies him with air at ambient pressure plus one pound/in<sup>2</sup>. The air passes along the inflation tube on his left chest and up into the side which forms the upper third of the trunk of his suit (Fig. 1). There are two relief valves on this side which at 1.5 pounds/in<sup>2</sup> pass air through into the left hand. The hand has an internal free flowing relief valve set at its lowest point some 8 inches below the mouth. The hand has a transparent flapless which is fitted with a stopstop for emergency use if the escape is not able to stop the head when it comes to the surface.

The new new escape tower (SET) is fitted so that its upper hatch is flush with the deck fitting and the lower and projects some 18 inches through the pressure hull into the torpedo storage compartment. In the tower (Fig. 2) handles a pressure tight light which can run off the main or from a self stored battery powered light sources are also provided. There are warning but not essential places of equipment. When the escape has entered the tower and the lower hatch has been shut all that he needs to do is to hold his HP air compensator into its socket. The flood valve is opened from within the submersible but it can also be done by the head man from within the tower. The water enters but because the air vent into the submersible is open the tower remains at atmospheric pressure. When the water has flooded up to the level of the vent a hatch is opened. The can be hoisted easily and the vent is closed from within the submersible. The last man



has a cap which he can fit over the opening of the vent in the tower, but even then is not satisfied as the water floods into the tower faster than it can escape.

Once the vent is closed the incoming air must compress, but compressing air back. The vent from the upper part of the tower drains into the submersor at 20 ft. at a height to provide the optimum sized airlock when the tower is flooded since the volume of the airlock is not fixed, which determines the rate at which the incoming air enters will pressure the tower. In fact the height will always be set for escape depths of 400 feet and no adjustment need be made at shallower depths. The rate of pressurization, which is also approximately constant, caused change of volume is also determined by the cross sectional area of the flood which admits the air water to the tower. An opening was selected for these trials which gave a pressurization phase of 22 seconds in the shallow runs and 28 seconds in the deeper runs, but it would of course be possible to select a larger opening and a more rapid pressurization for escapes from depths deeper than 400 feet. During the phase of rapid pressurization the escaper can think only of clearing his ears which he does against a double or even triple-earplugged eardrum. But opening the ports early when the middle ear is, surprisingly, no problem and only one case of eardrum tympanic membrane has occurred. The hand levers, actuated by the HRS. When the pressure within the tower has reached that of the air inside the hatch, "good" as he is saying and can be opened easily. The HRS continues down for 20 seconds to be held in place and the hatch ports operate. The water tower is disconnected with no progress to stop the escaper who, with positive buoyancy of 60 to 70 lbs. has nothing to hold him back.

The ascent is made at approximately 2 ft./sec. Rather than exhale continuously during these ascents all the escapers on the record trial breathed naturally from the air trapped in their lungs. When on the surface they held their heads to breathe fresh air while waiting to be picked up by a surface boat. Meanwhile, as soon as it can be seen through the port in the lower hatch that the escaper is close to the tower, the flood valve is closed and the upper hatch shut from within the submersor. The water is drained down, usually by opening the lower hatch so this is quicker than by the drain valve alone. The HRS control valve is checked, the drain valve is closed and the tower is then ready for the next man.

The HRS control valve (Fig. 3) is perhaps the most important feature of the whole system. It is a reducing valve working on a simple servo system. First air leaving the air lock should flow from the four 5 l. cu. ft. storage bottles at 4000 pounds/sq. in.² across the HRS control valve at 400 pounds/sq. in.². After passing through the reducing valve it leaves at the pressure demanded by the servo system. A foot lock leads to a diaphragm which is balanced by the lower ambient pressure plus the spring pressure which is set at one pound/sq. in.². Thus the air leaving the reducing valve at ambient plus spring pressure and passes direct to the escaper through the self-sealing coupling. A by pass valve was provided during the trials in case the reducer should fail to keep up with the rapid reduction of tower pressure but, after several modifications to the HRS control valve, it was never needed.



In these trials there were numerous small delays between egress gear for various safety checks, to get rid of the sea water which had drained into the submersible from the tower and to trim the submersible again at the right depth. Nevertheless, the sequence of 19 seconds for the complete cycle was maintained on the few occasions when it was possible to load and escape in quick succession. On the last day of the trials 9 men escaped in 30 minutes, due to an emergency one man could escape every three minutes.

It had been envisaged that the phases were approximately —

Entering the tower and lower hatch closed and ready to go	30 seconds
Flotation, or escape, pressure	50 seconds
Rapid compression to pressure of depth	less than 15 seconds
Opening hatch and exit (jump to maximum pressure)	less than 4 seconds
Opening water from tower	40 seconds
Safety checks (breath only)	at least 60 seconds

The only defect on this trial was one which should be easily resolved and was the rupturing of some of the compression bags during the ascent. It is thought that this was due to inadequate venting of the rapidly expanding air. It never affected the majority of the trials and the escapee's positive buoyancy, but the incident did mean that many of the ascent rates were slower than they should have been.

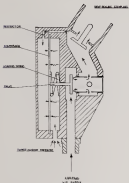
In spite of the rapid rates of compression there was only one reported ear drum. It is considered that even if the compressed escape were to rupture his drum at this phase it would occur so quickly as to be virtually painless and would cause no serious side or after effects.

Within the latex hood there is an inner hood which fits tightly around the face leaving a free seal which is part of the structure and protecting the neck and the back of the head from the cold sea when on the surface. Further modification is needed to this to ensure that the pressure of the air at the external air ring can be equalised rapidly. In one area the air between the inner hood and the ear drum was isolated and compressed during a separate trial that a reserved air with bleeding into the external system. After this incident the inner hood was not used again during the trial.

It might be thought that the compression of the air back would generate serious heat but apart from one comment that it was not warm to touch the results say the heat was not noticed by the escapees.

Should the HES control valve fail there was in the trials tower a by pass which the escapee could use to maintain the air supply. The one accident which should always be borne in mind would occur at or at the beginning of the pressurisation phase the HES system failed completely or if the escapee was no longer able to hold his HES consciousness into its socket. Under these conditions it is obvious that the remaining air within his respiratory tract, nose and hood would be compressed and he would be exposed to the risk of a serious systemic or compression injury of the chest. However, the failure of the HES control valve before flooding would be noticed when the escapee enters the tower because his state and head would not adjust when he plays or has unconscious. Provided all the factors occurred as the

# DIAGRAMMATIC ARRANGEMENT OF HIS CONTROLLER



- — — — — STEEL
- — — — — ALUMINUM
- — — — — BRASS

Fig. 3. The HIS control system is a self-contained unit at present which controls the motion of the plates of the HIS and is a self-contained unit.

later stages of compression, the effects would be cushioned by the 24 tons of air within the suit and head which, when compressed, would probably still be enough to provide him with some positive buoyancy.

In the tank there were no symptoms of nitrogen narcosis or of oxygen poisoning.

The second trial was described as exhilarating. No signs or symptoms of pulmonary barotrauma or air embolism followed. In fact the risk of an accident is probably less since it is much easier to breath naturally than to rebreath continuously. The man was recovered by a surface boat and within two minutes of their surfacing were within the protective vicinity of a recompression chamber on board an aircraft ship. There were no symptoms of decompression sickness and no air embolism was reported.

The outcome of these trials was that it is now considered that the new Flood Inflation System will make it possible for deep submersibles with an egress ability or lengthy transient air escape from a submersible lying on the floor of the sea and any where within the limits of the Continental Shelf.

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## SYNOPSIS OF MALARIA

By James Cunningham P. J. Preston, R.N.

The purpose of this synopsis account of Malaria is to present a summary of the disease as far as possible in terms that are familiar to the doctors of general medicine. Many texts on this disease confuse the reader by the multiplicity of medical terms and by a free use of synonyms. Although much attention is to be known about Malaria it is the writer's belief that little is to be gained by perpetuating a special language custom of the days when medical inquiry was restricted to descriptive alone. Despite the uncertainty of this disease some confirmed facts are known and these are sufficient in number to provide a reasonably firm basis of facts from which logical diagnosis and therapeutic action can proceed. It is hoped then this description will acquaint the reader with these few facts, putting the other terms into more conventional language and thus making more learned texts easy to read.

When taking the personal history of a new patient it is now customary to ask what pills, medicines and drugs are being taken. To this part of history taking should now be added even in temperate zones the question "Have you been out of the country in the last five years and where have you been?" Despite the fact that it is claimed that Malaria has been eradicated from some areas it is wise to be prepared and regard all tropical and sub-tropical areas of the world as being possible locations in which Malaria might be contracted. There do seem to be grounds for the claim that it has been eradicated from some areas of Europe where Malaria was previously endemic, in particular Southern Italy, Greece and Cyprus.

Furthermore it must be appreciated that even a history of having taken prophylaxis, anti-malarial drugs does not exclude the possibility of infection, for strains of plasmodia resistant to prophylactic preparations have been reported particularly from the Far East, and the local emergence of chloroquine resistant organisms Malaria has been substantiated (WHEE 1951).

In local Malaria can only be forgotten as the patient's past both in the tropics and sub-tropics, as well as elsewhere in the world when the patient has travelled through the endemic areas by either air, sea or land.

## LIFE CYCLE OF MALARIA

The most convenient point at which to start considering the behaviour of this parasite is at the moment when man is infected with the malarial organism. This is introduced in the ordinary food which flows down the pharynx of the infected (some emphasize mosquito when the probe the tongue of the human host searching

for a capillary is available. It is also worth noting that the very minute lymphocytes which enter a host capillary, after the other smaller mouth parts of the insect have cut the skin, stream down its length a salivary duct which discharges into the capillary lumen throughout the whole area that the insect is taking a blood meal.

Despite the fact that the spermatocytes are discharged into the circulation they drop out from the blood stream in a few minutes and establish themselves within one of the polygonal cells of the liver. The suitable compartments of the host's body is a luxurious environment for a parasite depending survival only phagocytosis, osmotic mechanisms and perhaps clink by chemicals in the form of prophylactic drugs. These surroundings are therefore rapidly exchanged for the relatively more secure environment within the protective perimeter of the liver cell where foodstuffs and water are readily available. Having established this "safe-haunt" the parasite behaves as a giant octopus in a hostile land by reproducing to reduce the odds against survival.

Within the liver cell the spermatocyte rounds up and grows subsequently developing asexually into some 10,000 to 40,000 macromeres. This phase of sexual reproduction or schizogony is known as the pre-erythrocytic, or liver phase of development and the mass of infective particles macromeres within the vacuole discarded liver cell is called the pre-erythrocytic mass.

The infected liver cell eventually ruptures, releasing vast numbers of macromeres into the vascular compartment of the body of the host once more. During this second venture through the body fluids of the host many macromeres are probably destroyed, those that survive penetrate erythrocytes where they are again secure. Each macromere established in an erythrocyte will then follow one of two lines of development.

Most will grow and mature in a short time, feeding on materials available within the red cell and will round up in undergo a further phase of sexual reproduction. Hence this phase of development is called erythrocytic, schizogony and the parasite having undergone division within the red cell is called a merozoite. For purposes of description all macrolife, growing forms of the parasite are referred to as trophozoites but once merozoite division has taken place they are called merozoites. Erythrocytic schizogony ends when the red cell ruptures containing the merozoites, ruptures releasing further macromeres and eventually causing the permeation of malarial fever. Each released macromere will then either be destroyed in the blood stream or establish itself in another erythrocyte thus perpetuating the erythrocytic cycle.

In each generation of macromeres a few will undergo an alternative form of development and will mature into cells capable of sexual reproduction when ingested by a female anopheline mosquito. These specialized forms of parasites, the gametocytes, are carried into the insect's stomach where the erythrocytic merozoites are broken, probably as a result of the fat in the ingested blood. The gametocytes change their form, the "male" macrogametocyte cell engulfs the fragments of nuclear chromatin expelling flagella and then produces the "female" or macrogamete forming an associated cyst, the oocyst. The blood then passes through the insect's stomach

in depth in the outer wall of the stomach, just under the lining of the body cavity into which its contained sporozoites are released when the cyst ruptures. These sporozoites then migrate through the body cavity to come to rest in the suberythral glands where they remain, awaiting the insect's next blood meal for dissemination into the human host. It is important to bear in this point that the insect may well live long enough to take many blood meals after it has become infected.

#### DATA ON TIMING IN VARIOUS SPECIES OF MALARIA

Table 1

In man	<i>P. falciparum</i>	<i>P. vivax</i>	<i>P. malar</i>	<i>P. malariae</i>
Incubation period	9-20 days	8-20 days	11-21 days	20-35 days
Pre-patent period	2 days	2 days	8 days	20 days
Cryptosporic schizonts		11-16	16-20	16-20
Course of relapse	30-40 hours	48 hours	48 hours +	70-80 days
Appearance of recrudescing parasitaemia after start of illness	7-12 days	2-3 days	12-14 days	1-14 days
<i>In mosquitoes</i>				
Duration of sexual phase	Very variable and dependent upon temperature	8-9 days at 25-28°C	10 days at 25°C	15-20 days at 22°C

#### Morphology of Malarial Parasites

In practice malarial parasites are only sought in peripheral blood and without special treatment it is almost to embark on diagnosis by examining thick blood films with such methods as Field's stain. The description will therefore be restricted to those forms of parasites found in a thin blood film stained with Leishman's stain.

Because of the special treatment required completely to eradicate malaria due to *Plasmodium*, with its very cryptosporic cycle and because of the special dangers of infection with *P. falciparum*, the descriptions are in examining a blood film is firstly to diagnose the presence of some form of malaria and secondly to differentiate between malignant malaria and the other three types. The descriptions will therefore be framed in these terms and detailed morphological data which are available in the standard textbooks will not be given.

Before undertaking Leishman staining it is essential to appreciate that malaria can be seen in the peripheral blood of man that is available certain minor steps are well worth the trouble.

1. Filter the stain or 'dyeing bath' can be achieved.
2. Stain the blood film as soon as it has dried.
3. 15 minutes of your time in of the pH of the water available will make more films than you need. Stain them in batches of three so that if one is under-stained you have two that are relatively over-stained and one of these

should be satisfactory. If, after washing, a slide is red and pale the water may have not been a pH, as frequently happens in steps, when the organism's deadened water is too acid for Leishman's staining. In this situation a few bubbles directed across an infectious border in the slide may solve the problem.

When examining films under the oil-immersion lens it is advisable if one lacks experience to stick to two rules:

Firstly, never say a cell is seen that is not clearly within an erythrocyte.

Secondly, report any object seen, within a red cell that does not show one or two dots of bright red stained nuclear material and also pale blue cytoplasm.

Strict adherence to these two rules avoids much confusion and provides that one remembers that if still left in doubt a case of *Chlamydia* has virtually no color effect, whereas the liver is anemic and does not influence bacterial or virus diseases that patients will not die for lack of a confident diagnosis.

#### Morphology of *P. falciparum*

Usually the parasites are prolate in the blood stream but occasionally they can be round or almost. The most important single feature of this parasite is that erythrocytes containing schizonts are filtered out of the circulation perhaps because the red cell becomes sticky, and the process of merozoogony goes on in the capillaries of the viscera and not in the general circulation. Only in cases of overwhelming malarial parasitemia are schizonts found in the blood film.

From the single fact two important points follow. Firstly in malarial malarial only trophozoites and gametocytes are seen in the blood film, and the latter only after the clinical illness has been going on for over a week. Secondly the obstruction of malarial capillaries caused by the sludging of the blood due to aggregation of adherent reticulating red cells is likely to play a large part in the local manifestations of malarial malarial.

On examining the collected blood the parasites can be seen as small and delicately staining rings within the red cell. There is often a double red chromatin dot and the presence of more than one parasite within one red cell is very characteristic of this species. Often a parasite will be seen lying within the curve of the edge of the red cell but for certain identification one should seek two thin 'ring forms' each about a tenth or eighth the size of the red cell containing them. Though such trophozoites are uncommonly very profuse in malarial malarial they may at times be scarce. If the gametocytes are present and can be found they are very helpful for they have a disc-like shape, on a right hand like a banana and it is across the concavity of the bend that one may see the stretched red cell envelope. No other species of human malarial has this shaped gametocyte, all the others being rounded in form. Once the delicate nature of the *P. falciparum* ring has been compared with the stout coarse forms of the other three species of parasites it is not difficult to be reasonably sure as to which group is present in a blood film remembering always that any given patient may have one or even more species of malarial present in the blood at any one time.

### Morphology of *Strongyloides stilesii*

The detailed morphology should be sought in major text books but most of the valuable distinguishing features between the three species in this group are listed in Table 2.

Having decided that one of the three parasites, *P. vivax*, *P. ovale*, *P. malayanus* was present, determine the size of the infected red cell. In both *vivax* and *ovale* infections they are clearly larger than the uninfected cells and the haemoglobinized contents contain Schüffner's dots. Schüffner's dots appear as fine punctate marks in the haemoglobin, in rows about twice or three times as dark as the rest of the haemoglobin in the erythrocyte. In *P. malayanus* infections the infected cells are of normal size and the contained parasites in time and heavily staining cells being seen as a characteristic 'band' form like a thick belt across the girth of the red cell. Once a tentative conclusion has been reached on these grounds look for the large schizonts with central papillae. Note that in *P. malayanus* the papillae are dark, almost black, and heavy, whereas in *vivax* and *ovale* it is in their parent red has a more 'coppery' colour. If well formed schizonts can be found the number of contained merozoites (each with its red staining chromatin dot) can help towards making a firm species diagnosis after reference to Table 2.

### MORPHOLOGY OF THE PARASITES

Table 2

	<i>P. vivax</i>	<i>P. ovale</i>	<i>P. malayanus</i>
Small merozoites	Large, most rings containing 8-10 rings	Same shape	Like others
Large merozoites	Abnormal shape when the central mass is deep, pale for the infected chromatin masses in the mass. Contain clumps of pigment. RBC collapse	When the central mass is deep, pale for the infected chromatin masses in the mass. Contain clumps of pigment. RBC collapse	Small, heavy and dark staining rings in mass. Small forms but enough large to see the RBC contents
Schizonts	RBC filled with the parasite and enlarged. Chromatin broken up in 24 merozoites. Pigment absent	Merozoites 4-12	Merozoites 4-8, may lack dense pigment
Gametocytes	Ringed parasite with bands to cover central mass of nucleus. Chromatin	Similar to others	Similar to others
Trigloin bodies	Polyploids of RBC. Schüffner's dots. Pigment absent	May resemble some. Pigment a distinct band of colour	RBC second size
Gametocyte development	Well developed stages and full stages, with a mass in U and S stages	Masses W and small. Masses	Masses W, U and Central. Merozoites absent. Well defined young. Capable of 10-15. Low level of American distribution

## PATHOLOGY OF MALARIA.

Much remains to be learnt about the pathology of malarial infections, possibly because consideration of the histological and marked anatomical changes seen about a fatal outcome in the most severe cases has produced a rather too static picture and distracted attention from the essentially fluctuating nature of the disturbance of function and biochemistry that occur in disease. Because of the uncertainties the following account is in the nature of a reasonable working hypothesis, bringing together certain observed facts.

The predominant feature of any malarial infection is the episode of fever and chills known as the paroxysm. This is believed to be initiated by the release of some toxic substance at the moment of sporulation, when a number of merozoites rupture their containing red cells at about the same time. This theoretical explanation is not contradicted by the fact that at the start of many primary malarial illnesses the fever is irregular and not periodic, for in their early stages there are often several broods of parasites at different stages of development and it is only later as the disease that the parasites tend to follow a common cycle of maturation.

The initial lesion of the paroxysm is a chill with rigor accompanied by a considerable vascular reaction. This takes the clearest pattern of a low cardiac output state with a disturbance of peripheral vascular flow. There is also considerable evidence that there are varying disturbances of regional vascular flow in the viscera, in particular in episodes of malarial malaria when the early erythrocytes containing schizonts are found concentrated in certain organs, where their adherence contributes towards sludging of the blood within the capillaries where vascular flow is already poor. In such lowered peripheral vascular flow is sufficient to induce tissue anoxia affecting the walls of both the capillaries and the parenchymal cells supplied by the vessel. These local effects are compounded by four further disturbances of function. Firstly the fever increases the tissue demand for oxygen, each one degree rise in the temperature increasing the metabolic rate by about 7 per cent. Secondly, oxygen carriage in the blood may be impaired by anaemia resulting from destruction of red cells by the parasites and associated haemolysis. Thirdly the anaemia existing in the host places any malarial blood volume as a result of the loss of fluid and electrolytes. Lastly there is now evidence that the parasite itself produces a substance capable of causing more cellular anoxia by blocking an enzyme system concerned with oxygen transport.

To these effects of the acute illness must be added the negative effects induced with wasting and loss of tissue mass in the chronic disease. There is also a sustained reticuloendothelial response to the malarial toxemia with retention of the spleen and liver where the effects of repeated phagocytosis of the destroyed cells and malarial pigment results in considerable hypertrophy and replacement fibrosis the organs being sludged with the contained pigment.

Such then is the basic pattern of response of the body to malaria. The more serious local manifestations mentioned within the clinical syndromes of pernicious malaria and will be described in more detail under the clinical presentations. Some features must, however, be made of the systemic response. This is characteristically significant for the anti-bodies formed against the parasite which are found in the

cytotoxic lesions, the liver, a considerable percentage, approximately 10 per cent, have administered to volunteers as a plasma cryoprecipitant have been found to be regarded as being responsible for the characteristic pathogenesis of the changed disease as it is seen in those who have experienced in the interim past. In such individuals a high level of parasitaemia can be sustained without clinical disease, but this balance between the host and the parasite is readily disturbed by minor current infections or periods of poverty, with the result that the clinical disease may suddenly reappear in various forms during an attack of postmalaria dysentery in man after a surgical operation. This unusual response is however, complex, for though the anti-toxins have a protective function, they may also play a part in the haemolytic aspect of the disease in which parasitaemia and malarial red cells may be lysed with great speed causing haemoglobinemia and profound anaemia.

#### CLINICAL FEATURES OF MALARIA

The general clinical features of the malarial fever can be considered under two headings. There is the clinical parasitaemia and the effects of the local pathogenic process previously described. These latter features are of course most prominent in heavy infections with *P. falciparum* but there is little to be said of the pathogenesis in heavy local manifestations as a cause in common.

##### The Parasitaemia

Though the episode of fever with its usual cold shivering phase followed by a hot period ending in a drenching sweat is the classical feature of all forms of malaria, it is in fact not at the start of the disease only in quartan malaria and in relapse or recrudescence of *P. vivax* and *P. ovale* infections.

As the onset of clinical fevers between malaria and malignant malaria proceeds in time it may be that the irregular nature of the fever may particularly in *P. vivax* infections is due to the fact that in the early stages of infection several strains of different parasites may be present in the same host and it takes time for a regular rhythm to be established. Certainly in the early primary infection the fever is irregularly recurrent and it shows a sustained rise varying more than two degrees during the twenty-four hours. This is accompanied by headache, back pain, prostration, shivering, feelings of short duration and nausea.

Towards the end of the first week the fever assumes a periodic form recurring regularly every 48 hours when the rupture of the erythrocytes, schizonts occur. The onset of the parasitaemia is commonly rapid and recognized by the patient as he has had a before such a sudden feeling of intense cold during which he shivers and has innumerable rigors. Pulse increases and is then replaced by peripheral cyanosis. The pulse rate soon falls but cardiac output is low. Headache, nausea and vomiting are common but after some forty minutes, during which the patient feels like shivering under more and more blankets, the cold limbs become burning hot and dry. A flush spreads over the whole body and the subject becomes restless, throwing off the clothes previously so eagerly called for. The pulse becomes hyperdynamic and the respiratory rate rises to the fever climate. In the next

severe infection the fever may become hypopyrexial and the condition may end in death, showing only a deepening continuity of the previous peripheral vascular failure.

About about six hours of the hot phase a debilitating crisis begins and the fever falls and the patient becomes more comfortable though exhausted. It can happen that in the stage there is a further increase in the previous peripheral vascular failure. If pancytopenia continues untreated the spleen becomes tender and palpable during the second week anaemia develops and if haematolysis is marked proteinuria may appear. Without treatment pancytopenia persists every 48 hours becoming less intense as time passes.

Intermissions due to pharmacogen crisis follow the pattern of PI crisis very closely but in all respects the syndrome is very much milder and a consistent time at the start is less common.

Quartan malaria is a severe disease usually showing regular 72 hour periodicity from the start, but not more than with the relatively long period of suberythremia that it is not infrequent for there to be two or more bursts of paroxysms that are united by a tertian pattern. The most striking feature of the paroxysm is that the hot stage tends to be prolonged up to six or eight hours and with the onset of evening collapse may be prolonged. Another feature of quartan malaria is worth mentioning, namely that in children it is not rare for the fever of quartan malaria to be continuous and for the illness to present as a septical syndrome with systemic low serum albumin albuminuria with raised gamma globulin and cholestasis in the serum. Secondly an intermittent fever of quartan periodicity is occasionally seen as unexplained septicaemia in young adults. Attention must also be drawn to the fact that quartan malaria has been known to recur up to 30 years after leaving the endemic state.

In both forms of benign fever and in quartan malaria local manifestations of disease can occur but are rare and the diseases themselves are most likely to re-appear or recur at times of previous debilitation, fatigue and stress. It is, for example, common for malaria to emerge early in an attack of pneumonia or soon after an operation for appendicitis.

Malignant malaria due to PI falciparum is the most serious and dangerous of all forms. This may in part be due to the rapid rate at which the parasite multiplies and also to the fact that the falciparum merozoite appears to be capable of penetrating red cells of any age whereas the malarial stage of any of the other protozoa seems to be capable of penetrating only young erythrocytes, meaning thereby some two per cent of the circulating red cells in any one day. Whilst it is an interesting rather obscure fact that the local manifestations of disease are most common since it is only in this form that suberythremia takes place in the normal capillaries where most shunting of the blood occurs necessitating local metabolic changes.

As with all infectious diseases the clinical result is the outcome of the interaction of the virulence of the organism and the number present on the one hand with the total resistance of the host on the other. It is therefore not surprising that all grades of infection may be found following infection with PI falciparum. At one end of the scale in the indigenous host with high resistance a large number of



persons in the blood and into clinical illness, while in the spleen is the most common source with a relatively short preincubation but longer clinical disease.

Commonly there is a vague prodromal period of malaise with languor, joint pain, headache and sometimes diarrhoea of the bowels, during the last three days of the 8-12 day incubation period. At the end of this time the illness starts abruptly with an irregular fever often remittent for some days. Headache and vomiting are common and diarrhoea is occasionally the most obvious symptom. During the early stage in the infectious stage may be absent and are often limited to very transient irregular periods of diarrhoea lasting no longer than a moment. Headache is often a prominent symptom. In the untreated case systemic collapse rapidly, the leucocytes falling 50 per cent during the last week, by the end of which time the spleen is only slightly enlarged but usually tender. The liver also enlarges in tenderness and when of the temperature is common at almost any stage of the illness.

In a few days the fever settles down to its regular daily (quotidian) periodicity when the prostration lessens but the high fever temperatures in the blood, film and the various shaped gametocytes which appear after the second week of the disease are but a pale reflection of the number of schizonts occurring in the splenic capillaries. At any time these latter may flood the circulation with merozoites or cause severe local disease, the numerous forms of malaria, which may threaten life.

Before leaving the general effect of malarial infection, brief mention must be made of its effect on children. In the endemic zone malaria is very much a disease of childhood for it is at this time that immune capability is established and the few immunologically capable tend to die. The fever is often not obvious, though if it does not considerably overtake the system. Usually there is marked loss of weight and failure to develop at the normal rate. Lymphocytosis and hepatomegaly develop early and both organs tend to be painful, the spleen being very liable to traumatic rupture, also anaemia is seldom inconsiderable. In chronic disease wasting may be marked and accounts the prostration, help caused by marked splenic enlargement.

Over and above the general systematic effect of malignant malaria must be considered the numerous complications. These are almost completely limited to malignant falciparum malarial infection. A few of these complications are due to overwhelming infection, but the majority are due to local tissue action. In both forms there is commonly a considerable parasitaemia in the blood but this is far less markedly marked in septicaemic forms. Profound peripheral vascular failure is referred to as 'Algid malaria' and if, as occasionally happens, temperature attains a low, hypopyrexia can occur.

If the prostrating forms of malaria are heard it can be seen why the malarial syndrome has been placed on the importance of local vascular disturbances.

#### Clinical

##### Delirium-convulsant

##### Gastro-intestinal

##### Black water fever: haemolysed with a degree of renal failure

##### Algid

## CEREBRAL MALARIA.

The numerous manifestations of focal tissue damage consequent on microvascular shunting in falciparous malaria is a disturbance of consciousness which may vary in degree from a state of confusion and lethargy to brain coma. This can continue in adult life in an unconscious or disturbed but there are also cases demonstrating focal signs and symptoms such as hemiplegia, epilepsy, bilateral weakness and spastic disturbances due to localized damage in the cortex, brain stem or spinal cord. Quite apart from these, the neurological manifestations of malarial infection are very common in the early stages of cerebral malaria and the diagnosis must come to mind in cases of apparent acute psychosis developing in the tropics or in those who have just returned from malarial areas. As always it is possible for such people to take a drink while consciousness and cerebral thought are still at their optimum and the smell of alcohol on the breath does not exclude the presence of cerebral malaria.

In my opinion the only patient with such a wide range of clinical manifestations the clinician can rely on to keep the disease in mind. Apart from the geographical history which may start the doctor it is well to be particularly suspicious of the presence of malarial malaria in any patient manifesting the disturbances of behaviour or consciousness or focal neurological signs when these are terminated by a fever. It is true that the muscular activity of any fit results in a rise in temperature, but in primary epilepsy and most forms of secondary convulsions the body temperature returns to normal soon after the acute tonic and clonic phases have passed. If persistent fever is observed an infectious aetiological should be suspected and among the possible aetiological agents *P. falciparum* should be sought. Secondly any such patient should be repeatedly observed for minor focal fits or muscular quivers which may be very transient though repeated and in cerebral malaria often involve the fingers and hands. It is of course essential to make repeated examinations of blood films for ring forms of *P. falciparum* but there can be very easily no change in appearance when the cerebral capillaries are packed with schizonts. A negative blood film does not therefore necessarily exclude cerebral malaria and under such circumstances it is wise to give chloroquine if there is any possibility of the infection being present. The effect in cerebral malaria is rapid and life saving while the drug does not alter the clinical course of any other cerebral infection with the possible exception of an amoebic abscess of the brain. Such empirical therapy does not therefore cause the clinical confusion such as may follow 'bismuthous' inhibition of potent antimonials in unexplained febrile illnesses.

## RELUCTANT-REMITTENT FEVER

The variety of malarial fever occurs when the maximum blood input is in the liver. The paroxysms are commonly severe and the fever is constant from the start. Vomiting and epigastric pain are frequent and the vomit may contain coffee grounds. The liver is enlarged and tender and the spleen is usually tender and palpable. There is anaemia, tachycardia, sweating and vomiting combined together in these delirious, chillsy, dyspeptic and diaphoretic collapse.

## GASTROINTESTINAL MALARIA.

This syndrome is important as it commonly presents with lower abdominal pain and diarrhoea, often accompanied by the passage of blood mixed stools, thus resembling bacillary dysentery more than any other disorder. Though the impact of this disease is commonly on the spleen the clinical picture can be distinguished from acute appendicitis, since the liver is a little high. Also the spleen may be palpable and thus shed some to the fact that the reaction is more complex than is first apparent.

## BLACKWATER FEVER.

Despite the fact that malaria is the commonest haemolytic disease in the world the exact pathogenesis of this process is still mysterious. It seems to occur only in those who have been exposed to the disease for some length of time and who have taken suppressive drugs, irregularly and it was certainly more common in the days when quinine was widely used for this purpose.

It is now clear that the spleen is a red cell become; the target is an metabolic attack, in relation and in the process of 'burning down' the cell envelope becomes more hostile. In this respect it must be remembered that *P. falciparum* is capable of invading and surviving in erythrocytes of all ages including the more fragile aged cells. It is therefore not surprising that haemolysis always seems to be more marked in malignant malaria than in the other forms.

With increasing knowledge of the process of haemolysis under different circumstances the reaction has been further confused. For it is now known that some of the drugs used in the treatment of malaria have a haemolytic action. Both 4-amino-quinolines such as chloroquine and 8-amino-quinolines such as pamaquine though not usually haemolytic in therapeutic doses, can, particularly in the presence of a congenital abnormality or deficiency of glucose 6 dehydrogenase when the erythrocyte comes a profound fall in the blood count with incidentally the production of Heinz bodies. Though this congenital deficiency is most common in negroes it does occur in white people, particularly in those from Southern Italy and the Eastern Mediterranean countries. Lastly, it has been suggested that in Blackwater fever there may be some auto-immune haemolysis but this has not been confirmed as yet. Now are there all the factors for the haemolytic haemoglobinopathies which are widely distributed in the tropics are themselves prone to malarial episodes, of haemolysis. Despite this one must note as pointing, Allison, proof of Ford's concept of balanced polymorphism amongst the alleles from haemoglobin S that in Africa where this haemoglobin seems to have a protective action against *P. falciparum* and therefore possession of the abnormal gene confers the protection with a beneficial advantage over the normal configuration, when in the malignant malarial epidemic zone. Suffice it to say that any of these mechanisms may play a part in the acute severe haemolytic episode that occurs in malignant malaria and contribute towards the syndrome of Blackwater fever.

The condition is called black water from the colour of the urine which after a massive haemolytic episode contains both urohaemoglobin, a red pigment and





Chloroquine sulphate — 700 mgm base approximately, 100 mgm in 4 hours (note that in 40 mgm base is 1 ml, suspension of 5 ml given in 20 ml diluent.)

Chloroquine hydrochloride — 400 mgm base in  $\frac{1}{2}$  l. volume given slowly intravenously

Quinine hydrochloride — 800 mgm (30 grains) in 1 l. volume given slowly intravenously

These parenteral drugs should be replaced by oral administration as soon as possible

#### Dosage for Children

	Frequent	Pyrimethamine
Prophylaxis		
Adults	100 mgm daily	25 mgm weekly
6-12 years	25 mgm daily	6.25 mgm weekly
6-12 years	50 mgm daily	12.5 mgm weekly

#### Treatment

Chloroquine: 25 mgm/Kg body weight over a period of three days is the basic schedule. An alternative is that described by Magrath and Adams (1953) which is essentially

1-6 months	1½ tablets over three days	
6-9 months	3 tablets over three days	Each chloroquine
10 months-2 years	3 tablets over three days	tablet containing 100
2-5 years	4 tablets over three days	mgm base
6-10 years	5 tablets over three days	

For parenteral administration the total requirement of chloroquine is estimated on a basis of 5 mgm/Kg body weight and this is given in two doses in four equal

#### Pyrimethamine (and other folic-acid antagonists)

These drugs are considered too toxic for use in children under 5 years of age and administration of sodium should not be interrupted, suppression being used for a prolonged period instead. Between the ages of six and ten years 7.5 mgm of pyrimethamine can be given daily for a period of 14 days and those over ten years of age are given 15 mgm daily for the same period.

Following treated the acute illness due to malarial infection, the character is fixed, with the need to moderate the ana-malarial cycle in cases of infection with *P. vivax*, *ovale* and *milvax*, but of course no further treatment will be required in chloroquine malaria, in which form an ana-malarial cycle exists. For this purpose drugs of a different chemical structure are required.

#### Antagonists

Primaquine — Dihydroquin 25.5 mgm tablet equals 15 mgm base

Phosphorin 15.5 mgm tablet equals 7.5 mgm base

Proguanil: Primaquine — More toxic than primaquine and now no longer used

The normal dosage is 2.0 gms of the base three times a day for a period of 14 days if the three forms of malarin mentioned above are to be included in their neo-cyclohexyl form.

Under usual circumstances the drug should be given with hospital supervision and close nursing observation since it has considerable toxicity. If no patient administration is essential it is customary to reduce the dose to 0.5 gms daily for 14 days. While taking the drug patients may experience abdominal discomfort, vomiting and occasionally diarrhea; also a degree of mild cyanosis occasionally develops owing to the presence of methaemoglobin in the blood stream. Being a haemolytic drug this action is the main factor in treatment and all cases should be watched with care for haemoglobinuria and it is unusual to observe all our patients in the age to be looked for.

The proper treatment of any clinical case of malarin therefore boils down to the simple matter of the proper use of 4 aminoquinolines accompanied by the administration of 8 aminoquinolines when evidence of fevers, rigors or splenic enlargement is indicated. Most drug responses and in 8 aminoquinolines should occur in one together as the toxicity of the latter may be side used.

It has become clear in recent years that certain strains of malarin parasites have become resistant to chloroquine, amodiaquine and mefloquine. Though this development is perhaps not as common as it may seem, care has failed to obtain a response to treatment is most commonly due to either failure of administration of chloroquine, amodiaquine and mefloquine or even do occur in SE Asia, E. Africa and parts of S. America. If failure of clinical response suggests such resistance in an individual case it should be remembered that there is cross resistance with all members of the 4 aminoquinoline group but that such strains are sensitive to quinine which should be given in doses of 10 grains (640 g) eight hourly for five days. The sulphate, hydrochloride or dihydrochloride are all effective in the same dosage for the clinical attack but a further course may be required particularly in the case of infection with *P. falciparum* which is rarely completely eradicated from the blood stream by one course of quinine.

#### DRUG TREATMENT OF FEVERICULUS MALARIA

Most rapid treatment of the clinical infection is essential and the route of administration is therefore usually estimated though if the patient can swallow oral treatment should be used as soon as possible for more rapid 4 aminoquinolines act as quickly as when given by parenteral routes. The clinical routes of administration and forms of the drugs available have been previously given.

#### FURTHER TREATMENT OF FEVERICULUS MALARIA

Profound anaemia will require transfusion of blood but this will need very careful cross matching as haemolysis usually occurs. Amongst indigenous people oral use is often required after the acute phase as their diets are frequently low.

Profound peripheral vascular failure, the Algal form responds best to high doses of quinine and there is some argument for starting these before going to

alkalosis-inducing drug. Some such daily dosage as 300 mgm of *Cantharidin* or 40 mgm of *Prothexin* drug is far more effective than the use of potent acids. Haemolytic episodes (black-water fever) also respond well to the above use of steroids and these should always be given as soon as possible after it is realized that haemolysis is taking place. Continued dosage must be judged on the clinical state and be progressively reduced as the patient recovers. In this regard one must always remember the potentiating effect of steroids on pulmonary tuberculosis which is frequently present in indigenous peoples in the tropics, so that if possible all such patients should bring a chest X ray before and after steroid treatment.

Renal failure may develop during the haemolytic episode and may be most difficult to recognize in its early stage. If possibly daily blood urea should be estimated as a steady rise in this constituent is probably the safest way of recognizing renal functional failure. Although not ideal, one may have to rely on measuring the daily urinary volume and if this falls below 700 ml a degree of renal failure should be suspected, as must be done if "black water" is seen in any individual specimen of urine. Once faced with renal failure the therapeutic aim must be to preserve fluid and electrolyte balance and to provide sufficient calories to keep endogenous protein metabolism at minimal levels. The first of these aims depends upon establishing the following condition:

**Daily fluid intake** — Urinary output plus measurable water loss minus water stored from carbohydrate metabolism.

Thus the fluid intake per day should be restricted to the sum of the volumes of urine passed and vomit expired in the previous 24 hours, plus an approximation to the daily insensible loss, varying from 1 to 1½ litres per day depending on local temperature and humidity. This figure is a guideline therefore usually a matter of guesswork. Equally it is difficult in practice to do more than guess at the volume of water stored from carbohydrate metabolism. Against such uncertainties it is often helpful to keep a daily record of the patient's weight with a volume intake of 1500-1700 per day one expects a daily weight loss of something like 100-400 g per day. Any excess over this should be regarded as water stored and the daily intake be reduced accordingly.

Formerly the supply of calories has become easier as it is no longer essential to restrict the patient to starvation conditions of this sort, as that advised in Hill's regime (1949 and 1951) all of which measures became obviously mixed very quickly in respect of calories. It now appears that endogenous protein breakdown is put to well resistance if the patient is put on a diet of about 1700 calories with 20-40 G of protein reasonably achieved with a diet of milk, eggs and liquid glucose.

In the absence of means of estimating serum electrolytes one can do little more to ensure that potassium intake is controlled. It must also be remembered that on recovery from the anoxic phase the patient passes through a period, which may last some days, in which there is a diuresis and the serum is metabolized. In this the diuretic phase of recovery, there is commonly a heavy loss of sodium chloride as this hypotonicity readily occurs and one must be taken to standard salt



et alia, including the amount given by the results of the Tustin test in the case of serum electrolytes cannot be estimated.

Admittedly mature populations also have less often lost and may need replacement very often; malaria has been spread, protein in the diet has often been deficient in the diet which should be improved if possible and finally many indigenous people live on the fringe of massive deficiency. A surprisingly few days of diets with fever, particularly if the diet is largely carbohydrate, will often push them well into clinical border-land across the dividing line into frank disease.

### MALARIAL PROPHELYAXIS

Avoidance of malarial infection begins with using the simple means of avoiding contact with the vector, such as clothing that prevents mosquitoes biting, particularly after dark, mosquito repellents on exposed parts and barriers such as mosquito nets or screened quarters. These measures are, however, inefficient and in urban and some rural areas the vector is situated directly either in the larval stage or in the adult form with residual concrete spraying of dwellings. Despite all these measures the most efficient method of prophylaxis for a designated force in the endemic zone for a limited period or liable to pass through an endemic area is the regular administration of prophylactic drugs.

The ideal prophylactic drug has yet to be found. First of all one can start by eliminating species in the black-water syndrome is commonest when it has been used and it acts only on the asexual form of the parasite. Plasmodium and the other *Plasmodium* species are far too toxic for regular consumption but Mepacrine causes yellow pigmentation, occasionally scotoma and psychosis with frequent gastro-intestinal disturbances.

One is therefore left with the remarkably non-toxic *Stanozolol* species (*Chloroquine* or *amodiaquine* and the gametocyte *Proguanil* and *Pyrimethamine*). The latter is in effect similar to Proguanil but slower acting. The advantage of the gametocyte is that they are effective against prophylaxis in unknown *Plasmodium* species and remarkably non-toxic. They are also effective suppressive drugs in benign tertian and quartan malaria as a lowered blood level effectively destroys asexual forms of these parasites and thus prevents clinical disease. It does not however, influence the pre-erythrocytic forms from which the blood stream may become infected at any time when the blood level of the drug has been allowed to decline. There is one further objection to proguanil and pyrimethamine, namely that they are the drugs which at present are most frequently found to be implicated in the emergence of drug resistant strains of malaria. Nonetheless the gametocyte have great good points and, unless resistant strains are known to exist in the area not so concerned with, are probably the best choice as a prophylactic.

Chloroquine can also be used as a suppressive and is effective in malignant *Plasmodium* malaria as a schizonticide, which induces to eradicate the infection in the liver, so the erythrocytic cycle. It has no significant action on the pre-erythrocytic or neo-erythrocytic forms of benign tertian and quartan malaria which frequently emerges in an active infection when drug suppression is discontinued.

Apart from the essential need for prophylactic drugs to be taken regularly there is some argument about how long they should be continued after leaving the endemic zone. Reference to table 1 shows the duration of the prophylactic and suppression periods in eleven instances; that those authorities who advise giving suppressive drugs for only two weeks have no real reason on their side. Nevertheless it is a matter of experience that on such a schedule occasional cases of malignant malaria do escape after return to the country, even when there are no grounds for doubting that the drugs have been taken scrupulously. Therefore some experts advocate continuing drug administration for one month after leaving the endemic zone. As most servicemen return home on foreign service leave after a continuous period and are therefore away from their regular medical examinations, it seems preferable that administration should be continued for one month.

**Prophylactic schedules with particular drugs**

Prophylax (Pfenberg) — 100 mgm daily, 1 tablet.

Chloroquine — 500 mgm base once a week.

Pyrimethamine — 50 mgm base once a week.

Interferon with foreign service and overseas malaria will be effectively suppressed with the regular use of the above drugs. However the merozoogony cycle will not be influenced and it is likely that selected individuals, or a proportion of them, will develop classical malaria on return home after chronic prophylaxis has been discontinued. Such recurrences or emergencies of the disease very often occur at inconvenient times such as when Royal Marines are on exhausting missions, or after injuries, operations or intercurrent infections. For complete eradication of the infection an further question should be given for 10 days and this should be done in hospital. If conditions are less than ideal for immediate treatment it is always advisable to conduct suppressive prophylactic treatment until the patient can be returned to base. Hence, for example, Royal Marine detachments on winter exercises in Norway need to take supplies of paludrine or chloroquine with them despite the fact that they will not acquire malaria in the area.

#### MANAGEMENT OF INDIVIDUALS WITH A HIGH IMMUNITY TO MALARIA

It frequently happens that natives, born in an endemic malarial area develop foreign service malaria, while in England. If they are shortly returning to the endemic zone area does them no service by attempting to eradicate foreign service malaria with full courses of *Prosimon* quinine. Individuals, such as Chinese apprentices in the country for three or four months, cannot, should be given a small dose of a 4 amino-quinoline such as Chloroquine (500-750 mgm base) with a view to controlling their symptoms and provided that their medical documents are annotated they can continue their course and return to their own country without damage to their own immunity. If they should be returning out of the endemic zone for a long prolonged period, milder cases with an 8 amino-quinoline should be treated out, particularly if they are likely to be under major physical stress when re-entrance of clinical malaria is frequent.

*Examples*

*Albion's appearance in England three months — small dose of chloroquine*

*Albion's visit to Devonport — full evaluation*

*Member of towing crew from Bombay returning home — small dose of chloroquine* *Caribbi assistance of Devonport* *Supply of chloroquine for first on the return voyage*

An effective schizonticide will, of course, eradicate malignant malarial. For malarial in endemic areas who suffer from chronic malarial, symptomatic treatment with a relatively small dose of schizonticide will suffice.

For the future there is every indication that the problem of malaria is by no means solved. Not only are the parasites beginning to develop resistance to some of the anti-malarial drugs at present available but the vectors have developed resistance to many insecticides. Also much is unknown about the disease process, deaths from malarial are still common, and morbidity from chronic infection, particularly amongst children, does monstrous damage. No doctor even in temperate climates dare disregard the ever present menace of the disease.

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## DRUG DEPENDENCE

By Surgeon Lieutenant-Commander D. H. MARJET, R.N.

*This paper is the result of observations made during a period of eighteen months while serving on an oceanic station in the Far East.*

### The Population

Over a period of eighteen months twenty patients were seen in this department who were dependent on drugs. Only one patient — a serviceman — was male; the other nineteen were the wives of servicemen or of civilians attached to the Armed Forces. During the same period forty males were admitted because of dependence on alcohol. No female alcoholic patients were seen at this time. While exact figures of the population at risk are not available it is believed that the incidence of drug dependence in women is of the same order as a habitual dependence in men.

The nineteen women in this series were taken from a total of three hundred and fifty-six women sent in the department during the same period. Nineteen women receiving drugs for psychiatric reasons represented 5.5% of the entire five patients who had received previous psychiatric care and 60% of the forty patients who were receiving drugs but psychiatric services on arrival in the area. None of these nineteen patients was on "maintenance therapy" with phenothiazines or any depressant drugs. Forty-one of the patients who had received previous psychiatric care had at one time been a psychomotor. Thirteen of the sixteen dependent women had previously at one time or another seen a psychiatrist.

### Type of Dependence

Morphine type	Patients	2
Barbiturate type	Barbiturate	8
	Chloralhydrate	1 (male)
	Meprobamate	1
	Chloralhydrate	2
	Meprobamate	1
	Chloralhydrate	1
Amphetamine type	Amphetamine	1
	Amphetamine	2
	Amphetamine	1
TOTAL		20

The definitions of and types of dependence used in this paper are those of the 12th Report of the Expert Committee of W.H.O. (1961).

### Age Distribution

12-44 years (average 34)

Length of medical (including psychiatric) history: 1-16 years (average 8.5)

#### *Insomnias*

The two patients dependent had been given the drug for periods of substantial years for which increasing doses were prescribed. The latter, a chronic fatigue disease, proved led to their referral to the psychiatrist. On previous attempts it well sustained performance at work only.

The other patients were taking their drugs for alleged mental distress, with one exception who was receiving large doses of a proprietary preparation of barbiturates for her "headaches".

Three patients were admitted having taken an overdose of drugs. One of these had previously been admitted to hospital for the same reason. Five other patients had a good history of hospital admission for drug overdosage. Karnal (1961) does not mention drug overdosages as part of the clinical picture of drug dependence of the barbiturate type. It is well recognized in the *American Literature of Drugs and Poisons* (1961) label Alcohol, Barbiturates, Cocaine, Hashish and Potions (1961).

The other patients were referred by their family doctor because they were not responding to treatment.

#### *Persons Prescribed Care*

Five of the seventeen patients who were receiving their drugs of dependence for mental illness had received in addition amphetamine, which is part of barbiturate, mescal and major tranquillizers, antidepressant drugs and electro convulsive therapy (ECT). In two of these persons, previous physicians had noted dependence, but had not taken action. Since these patients were dependent upon drugs and this was not dealt with it is not surprising that the previous treatment was not successful.

One patient had been taken off barbiturates and given diazepam pills. With the previous withdrawal symptoms it did not produce for her the euphoric she associated with barbiturate maintenance and she returned to barbiturates.

#### *Persons Dependent*

All the patients receiving drugs on psychiatric grounds had been said to be suffering from anxiety and depression. Three were not classified as psychopathic personalities. In retrospect it was difficult to determine the exact nature of the original disorder. The diagnostic labels were descriptive and the previous notes when obtained did not indicate why the patients had been left to be suffering from a condition requiring treatment rather than the physiological and psychological consequences of their difficulties. As such disturbances are based not on objective criteria but upon the subjective judgment of both patient and physician it is perhaps not surprising that in retrospect the indications for treatment were not clear.

Two patients were promiscuous and one patient had been prosecuted for shop-lifting. The remainder were respectable citizens.

After the original episode in which drugs were withdrawn and the patient placed in a position from which dependence could develop, subsequent complaints and the diagnoses based upon them must be examined carefully as some dependent the patient cannot resist its compulsion without entering the risk of her drugs being stopped.

*Spousal Relationships*

Most patients claimed that marital disharmony played a part in their marital illness. In eight patients it was the present spouse and in one a divorced spouse. Two patients who gave up drugs reported that their relationship with their husbands improved and even one who did not cooperate failed to report improvement. It was felt that the validity of the complaints of marital disharmony had to be judged against: 1) that it was suffered by a patient already dependent upon drugs as a reason for continuing their drugs and 2) that the patient's self-control would be reduced while intoxicated with drugs and therefore, as with the alcoholics, domestic friction would be a consequence of such intoxication. One patient taking phenothiazines was very suspicious of her husband regarding a presumed psychosis associated with morphine dependence.

The authors were of the opinion that marital disharmony is not reflected in the clinical picture and that at best it represents a rationalization on the part of the patient.

*Use of Alcohol*

Five patients dependent upon barbiturates and related drugs reported possession of the intoxicating effect of their drugs by alcohol. They also reported that alcohol and barbiturates could be substituted one for the other. Each said that when living in countries where alcohol was cheap they would take more alcohol and less barbiturates.

*Use of Chlorpromazine*

Three patients addicted to barbiturates reported that chlorpromazine increased the intoxicating effect of barbiturates but that it was not a substitute for barbiturates. They used chlorpromazine in this way when running low on barbiturates and chlorpromazine.

One patient said she preferred a mixture of barbiturates and chlorpromazine.

*Quantity of Drugs Consumed*

It was difficult to determine the exact quantities consumed because of the unreliable testimony of the patients and in some of the spouses. It involved detective work often involving through large numbers of prescriptions forms. Indeed four patients who on the inquiry denied taking more than garden doses of drugs developed severe withdrawal symptoms; three patients fit and one a psychosis identical with delirium tremens. In each case the husband said he did not realize that his wife was taking such large quantities of drugs and only a part of the patient's supply could be traced to legitimate sources.

The work of Ikell et al (1954) suggests that more than 500 mg (11 gr) of barbiturates a day for more than two months leads to severe withdrawal symptoms if the drugs are stopped abruptly. Loomis (1954) says that severe withdrawal symptoms occurred in a person taking up to 80 g of morphine daily. Luby (1955) reports dependence to glutethimide in doses in excess of 1.0 g daily. Hollister, Mittlebachner and Degan (1961) report withdrawal effects, not for barbiturates, from the massive psychosis in those receiving 500-600 mg of lithium daily. Wittinghausen (Hollister 1962) is reported as being a slightly more powerful

frequency than amphotericin. Bing (1964) has described dependence in a variety of anti-bacterial agents including amphotericin, chlorothalidon, chloramphenicol, chloramphenicol, meprobamate and chlorbutolone. These drugs can be safely used one for the other.

It may well be that these drugs are additive in effect and that a combination of drugs might produce dependence. This appeared to occur in one patient who has taken at least 1.2 g of amphotericin and 90 mg of ibuprofen daily and who on abrupt withdrawal became very restless and incontinent and who in order to avoid more distress, returned to the drugs prior to progressive withdrawal.

If the therapeutic dosages of the drugs are compared, the relative effect of each drug and its combination might be assessed. In order to facilitate comparison each drug should be compared with amphotericin. The equivalent dose of the drug to 60 mg (1 g) of amphotericin could be using the barbiturate equivalent dose.

#### Therapeutic dosages (Bing, 1964)

Sedative dosages		
Amphotericin	60	60 mg daily
Chlorbutolone	75	— 60 mg daily
Meprobamate	600	— 1200 mg daily
Chloramphenicol	115	— 180 mg daily
Methyqualone	215	mg daily
Myorelaxant dosages		
Amphotericin	150	— 160 mg
Meprobamate	300	400 mg
Chlorbutolone	250	— 300 mg
Methyqualone	150	mg

This suggests that the barbiturate equivalent dose (i.e. the dose of drug equivalent to 60 mg (1 g) of amphotericin) is apparently:

	Sedative	Myorelaxant
Amphotericin	160 mg	160 mg
Chlorbutolone	16 mg	—
Methyqualone	30 mg	50 mg
Chloramphenicol	180 mg	100 mg

Therefore if 500 mg of amphotericin will produce dependence, then equivalent safety the following doses of other drugs should do so:

10 g Meprobamate
1.2 g Chlorbutolone
120 mg Chloramphenicol
600 mg Methyqualone

These doses are for meprobamate and chlorbutolone & these approximations to the dose appeared to cause dependence.

These levels were taken as the maximum causing dependence in our patients and it was anticipated that severe withdrawal symptoms would result if the drug was abruptly withdrawn.

*Management of the Drug Withdrawal*

## (1) For the barbiturate and similar dependent

The patient would be placed on the dose of drug which was considered necessary to prevent the appearance of severe withdrawal symptoms. An intramuscular phenobarbital 90 mg bid was given together with chlorpromazine if the patient appeared disturbed. Progressive reduction of the drug dependence was made over seven days.

On this manner no patient previously recognized as dependent upon drugs developed more than subjective discomfort. The content of a listing of a patient with appetite, discomfort and a subjective report of difficulty on sleeping off is shown.

One patient taking at least 120 mg of chloralhydrate daily became very restless and appeared confused when the drug was stopped abruptly and it was immediately restarted and withdrawn in the manner described mentioned.

Of the barbiturate patients considered dependent upon barbiturates and related drugs four accidentally developed severe withdrawal symptoms as dependent was not recognized. These developed fits and one a psychosis identical with delirium tremens. They went through the withdrawal without recovered disturbance.

(2) The two pethidine dependent took their own discharge shortly after admission when withdrawal was proposed.

(3) An abrupt withdrawal of amphetamine does not give rise to withdrawal symptoms; this drug was abruptly withdrawn. These patients and they related subjective loss of energy and of euphoria and showed the objective changes of better sleep and less restlessness.

*Psychological Effects of the Drugs*

During the period when withdrawal for certain leading up to the establishment of the state of dependence and the problems associated with that state were discussed with each patient.

Of the seventeen patients receiving their drugs for psychiatric reasons all appeared to regard the physiological and psychological events associated with their experience of habit difficulties as events requiring medical intervention.

They appeared to be somewhat shy, introverted and introspective. They all appeared to cooperate in treatment and ceased to complain when drugs were withdrawn.

Some appeared hostile and resentful feeling that they were entitled not to be annoyed, disturbed or dominated by other other people or their responsibilities. They demanded euphoria and if this was obtained through dependence upon drugs they felt that they should secure enough medication. Of these four took their discharge against medical advice. Two of these patients apparently had drugs brought into them. These four patients did not cease to complain. The other three patients cooperated and ceased to complain. A similar case is reported by Felt (1964).

None of the patients who complained no withdrawal appeared to be either severely disturbed or disturbed people. They appeared to have become almost man-



ally dependent on the treatment medical student. However, the relatively small patients' sample is a limitation of their drug taking survey as regards its generality, but not a disqualification for validity. The findings merit re-investigation.

The initial failure of patients was appeared to be that they experienced euphoria with a drug that could cause dependence. It may be that their propensity for the experience of euphoria rather than a desire of personality.

#### FOLLOW UP

Of the twenty patients eight did not respond to treatment and presumably stopped to take drugs. Two of those who appeared to respond subsequently took drugs again. One taking no medicinal phenomena (Dermwell, Wellborn) and stopped and the other taking containing a mixture of carbamate and benzodiazepine (Perseman).

The remaining ten patients do not appear to be taking drugs. The follow up period is only 2-14 months, and the average duration is 2 months. These patients are taking the drug have ceased to respond. Two exhibit possible withdrawal symptoms — one a recurrent illness of nasal growth and facial pain and the other depression. Six, in spite of psychiatric histories, ranging from 1-14 years in length and average length of 3.7 years.

Of those who did not respond or took up drugs again, two were dependent on polydrug, three on amphetamines and two on barbiturates and related substances.

Of the ten cases, one was dependent on phenazepam and the other two on barbiturates or related drugs.

#### CONCLUSION

The twenty patients in this sample, all but one — a drug user however. All twenty were receiving drugs for perceived physical or mental illness. Seventeen were receiving their drugs for perceived mental illness. Three expressed concern per cent of the patients were who had substance, have treated the mental drugs. Thirteen of these seventeen patients had been under the care of a psychiatrist at one time or another.

Of course this does not mean that the doctor originally using the patient renders them dependent upon drugs. Subsequent doctors have great difficulties in recognizing the dependence features of the patient, variable testimony.

It takes time to become dependent on drugs, tolerance develops and increasing amounts need to be taken. As these patients have moved from doctor to doctor it is very difficult to recognize the true problem.

On the basis of this small series it appears that a significant proportion of patients come with a long duration history and are dependent upon drugs and the type of illness will not be always or easily defined.

The following points suggest themselves.

1. That drugs with variable psychopharmacological actions be studied and for tolerance will come, a certain dependence, including on withdrawal, the role of psychosis, chemical with different treatment.

3. That no doctor 'sues his own patients'. The doctor either will not prescribe them or they will, with developing tolerance, become dependants after they have left the doctor's care.
4. That once dependent, a patient cannot cease to complain without running the risk of the legitimate supply of the drugs being reduced or stopped.
4. Once drug dependence is recognised, the patient's complaints cannot have any status as manifestations of other syndromes. All complaints should be regarded as:
  - (a) manipulative behaviour designed to shut a supply of drugs.
  - (b) the moral disturbance of the drug, e.g. association with hallucinations and paranoid psychosis with amphetamine or
  - (c) withdrawal symptoms.
5. It appears that when withdrawal symptoms do occur, the patient's physical state always overstates those as a 'symptom' of the original condition.
6. Those patients who cease to be withdrawn of drugs cease to express their original complaints.

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## A NAVAL SURGEON'S ENCOUNTER WITH THE PLAGUE SUZ 1801

By William N. Doug Watson

In May 1798 General Napoleon Bonaparte with a French fleet and army<sup>1</sup> carrying the Army of the Orient sailed from Toulon for the straits of Egypt. Malta was occupied in June after a token resistance and in the end of that month Napoleon and his forces landed near Alexandria having narrowly escaped entry into by a British fleet under Admiral Nelson. Alexandria fell. Cairo surrendered and lower Egypt was overrun. The Turkish government declared war on France and when Nelson destroyed the French fleet in Aboukir bay he permanently disrupted communications between France and the army in Egypt but these events did not prevent the French from extending their occupation into Upper Egypt and Syria.

One of Napoleon's principal objectives was the control of the Red Sea, but he intended to occupy the British trading stations there and strike a blow at British commerce. An even more ambitious project was also in his mind. Suez was said to stand at the end of what in days of antiquity had been a canal joining the Mediterranean and the Red seas. Napoleon wished to investigate the possibility of constructing a new canal for with this in his control he could threaten British rule in India. Suez was therefore occupied by a French force early in December 1799 and three weeks later the place was visited by Napoleon himself accompanied by a train of soldiers, women and merchants.

In February 1799 the French returned upon their Syrian campaign. A Turkish force was defeated at El Arish on the Mediterranean coast. Jaffa was stormed and captured the indefensible and defective, scarcely measured and Napoleon advanced to the siege of Acre.

He got no further. The Turkish garrison was commanded by Abdallah Pasha the Barbary, and resistance was valiant. On the sea Sidney Smith in command of a British squadron monitored supplies and communications, encouraged and inspired the Turks and at a critical moment turned the tide of battle by landing with eight hundred seamen. In May Napoleon knew that he had failed. He abandoned the siege, withdrew French troops from Syria and, having returned to Cairo, there was recalled from there France which needed his army and needed his presence. Evading the British ships which patrolled the eastern Mediterranean Napoleon returned to Paris. He left the Army of the Orient and the administration of Egypt in the control of General Kléber who after his assassination was succeeded by General Marmar.

For three years the French maintained their rule in Egypt. Then in the spring of 1801 a British fleet landed on the Mediterranean coast and, over the battle

of Aboukir — a decisive victory marked by the death from wounds of the British commander Sir Ralph Abercrombie, who had been wounded in the engagement. On the first of October plans were agreed between Britain and France and General Marmont with the army of occupation left Egypt.

In accordance with Abercrombie's landing at Aboukir a force of 5,000 European and Indian troops had been sent early in 1801 from Bombay to the Red Sea. A *salutaria* party of this force under Major Admiral John Blakeney was dispatched with orders to land at Suez. It consisted of a squadron of the Royal Navy having on board an Indian contingent and three companies of the 59th Regiment (Mysore and Valentignol) under Lieutenant Colonel Lloyd. On his arrival at Suez Admiral Blakeney found that the French had gone and Colonel Lloyd received permission to march his three companies over the desert to the Nile and so to the Mahrta region. The main body of the force sent from Bombay to the Red Sea, which was commanded by Major General David Baird, landed at the port of Rosette and making no resistance made its way across the desert to Suez to join the British forces there.

To the list of the three pestilence plagues in Egypt, France, Britain and Turkey must be added a fourth bubonic plague, perhaps the most successful bulletpoint of all. The Plague could cripple an army by reducing manpower but the greatest danger was less. In the healthy lower world produce symptoms resembling acute disease in an infected person it might influence the course of the disease, the death was the inevitable outcome, as the virus was being dispersed troops it could bring about a general and profound demoralisation. Napoleon knew these dangers well. The principal cause of the disease was in the mites, he once remarked during his capture in St Helena. The worst protection, the most efficacious remedy was moral courage. It was in order to allow pain that he forbade the use of the word "plague" and that he himself visited the barracks at Isfah and voluntarily touched the buboes on the bodies of the sick and the dead. It was for the same reason that he shed medical officer Dr Razi-Hakimian Daghastan on the sight of the troops consulted himself in the grain and sewage with matter from the body of a patient, fortuitously without ill effect.

Bubonic plague was endemic in the native population when the French landed in Egypt (Piquet 1808). Indeed it is said that in the forty years preceding that even a million of the inhabitants had died of the disease in Upper and Lower Egypt (Thomson 1999). Of the prevalence of the mites infesting Neotoma Turkestanensis no accurate information is available but there could have been great foci of it and in January 1801 General John Moore took personal observation in Syria reported that the Turkish name was an endemic pest much dreaded by the population. On the other hand the experience of Napoleon's forces is well documented. The first cases were reported in Alexandria in July 1799 were seen after the landing and in less than eight months 1,500 men of an army of 35,000 had died of what was officially called the *fièvre à bubone* or then more vaguely a *peste* or *contagieuse fièvre*. At Isfah in the spring of 1799 plague struck, with violence the forces invading Syria and it made no more serious attack when those forces reached Acre. Indeed the French used their failure to capture the town

and their subsequent return to such as bubonic plague as to the combined efforts of Abdallah Salem and Ismaïl Smith. After the worst was of Syria the epidemic diminished but it still persisted in Upper and Lower Egypt up to the final departure from Alexandria of General Menou and his army in October 1801.

Bubonic plague was elsewhere proved to recover for Ralph Abercrombie and his men when they landed at Aboukir in March 1801 and as the troops passed through plague-infected villages on their way to Cairo the disease broke out with appalling malignity. The victims were crowded into old and filthy huts which had been visited by the French, surely all the medical men in attendance were infected with the pestilence and died and thus was also the fate of the hospital assistants and nurses (Thomson and Thomson, 1906). General Bouch's troops who landed at Rosetta remained free of infection till they reached Rosetta but Colonel Lloyd's companies of the 60th Regiment were infected as soon as they disembarked at Suez and lost a number of men during their march across the desert. (MacGregor 1884)

In both Britain and France a serious treatment began with sequestration of the sick. It was standard practice to administer mercury to the point of copious salivation. Bleeding, purgatives both oral and infusion of coffee were often employed. Some doctors favoured blood-letting and others claimed improvement after bathing with vinegar. Cinchona was always applied to bubonic to prevent suppuration and those which did not discharge spontaneously were opened with a lancet. In 1790 a 'New Method' to Cure and Prevent the Plague was introduced by the German physician, Count Leopold Reichenfeld. It was based on the observation that victims were not very seriously free of the infection. The cardinal element in this treatment was repeated evacuation with emetics often followed by purgation with pepper and the application of heat. Very soon after the French landed Dr Desgenettes issued a circular recommending oil treatment as effective (MacGregor, 1883) and as yet was continued throughout the war by some of the medical officers of the French army though with little enthusiasm by others it was condemned outright as useless (Piguet, 1884). The New Method became known in Britain through a paper published in the *Philosophical Magazine* of 1798. It was applied by British army surgeons in Egypt to a small extent in plague-infected corps of Indian troops but the results were not favourable and its further use was discouraged (MacGregor, 1884). The treatment was brought in 1799 to the notice of naval surgeons as likely to be of benefit by Thomas Trotter, Physician to the Fleet, in the *Medical and Maritime Courier* 1799.

Unlike their military colleagues surgeons of the Royal Navy concerned with the campaigns along the Mediterranean coast of Lower Egypt and Syria were not so far as so far with bubonic plague (Lloyd and Crocker 1884). The naval results supporting General Abercrombie's forces when they landed the porticoes escaped in operations up the Nile, even the body of 800 marines who landed with Ismaïl Smith at Aboukir all escaped the infection. Nor did the plague affect the ships in the Red Sea responsible for General Bouch's landing at Rosetta. It is convenient therefore to read a naval surgeon's description recently come to light of an encounter with bubonic plague when Admiral Blakeney's squadron arrived at Suez. The story is quoted in the unpublished diary of Thomas Robertson, surgeon in

the Royal Navy from 1799 to 1829. The manuscript is in the possession of one of his descendants, Miss E. M. Campbell-Hamilton, who has kindly made it available for study.

Thomas Robertson, son of a East Lothian farmer, was born in 1774, studied medicine for four years at Edinburgh University and joined the Royal Navy at the age of nineteen. After serving in the West Indies and off the coast of West Africa he spent last years in the China seas and the Indian Ocean. In September 1799 Robertson's ship, named *Thrasymachus*. His diary records that there he arrived from the Commodore's of Sack and Hart a pamphlet advocating the use of calomel, phosgene in the treatment of ulcers (Hagopian 1794). It is probable that at the same time there reached him Thomas Thomson's *Medicina Venerea* giving a description of the new treatment of plague.

When Admiral Boscawen in the autumn of 1802 was bringing together at Bon-hay his squadron for the expedition to Siam, Thomas Robertson joined the British contingent a vessel of the East India Company bound and fitted out as a man of war. The squadron was made up of ships of the Royal Navy with others provided by the East India Company and transports for the soldiers and the stores. The expedition sailed on 25th December 1802 and because of illness and adverse winds progress was extremely slow. In March on the *Admiral's* instructions Robertson joined the flagship *Leopard*, the captain of that vessel having died. There were many cases of severe ulcer on board which continued to increase in spite of Robertson's use of the local treatment with calomel snuffing.

On 20th April the squadron anchored three miles off Siam. The French had abandoned the town only eight days before on hearing of the expedition's arrival so for further down the coast and the local chief here came aboard the flagship to pay his respects to the admiral. A detachment of the 66th was sent ashore to hoist the British flag and reported on their return that the town was almost deserted, not above fifty of its inhabitants remaining in a very wretched state. Many of the dwellings had their doors built up a precaution usually taken when plague occurred as a fever and it was confirmed that plague had lately prevailed among the French. Two days later the three companies of the 66th disembarked and pitched their tents and the signal landed to make official inspection of the town and its defences and to show himself to the inhabitants.

On 25th April two cases of fever were reported on board H.M.S. *Porpoise*. Both of the men affected had been ashore both days and there was 'a suspicion of its being plague.' During the next eight days fever broke out among the soldiers in camp on land and it also attacked a party of marine, most of them Malacca employed, while on duty for the squadron. The progress of both board made a very welcome change of diet after four months at sea. Their return of health had been anticipated into the French service when the island was occupied and had later deserted and joined the British navy. On the admiral's instructions Thomas Robertson along with the resident surgeon of the 66th examined the men. 'No doubt is missed' he wrote 'I was convinced it was the plague, the particular symptoms, were high fever, delirium, coma, fulvous. This being reported to superior three already all from the healthy became the first consideration. Treatments pitched

beyond the gates of the prison for the reception of the sick. The only illness noted with reference to be landed."

In his diary Robertson made no further reference to the plague except for an entry at the end of May which shows that the infection was no longer one of his problems. Instead he seems to have been more concerned with other assignments and games were mentioned among the crew of the *Leopard*. But he later made a detailed account of the outbreak in a report submitted to Admiral Peter Ramsay, the naval commander-in-chief in eastern waters. The report shows that of preceding and well spaced steps at account of the outbreak of the steps taken to counteract and of the effect of time on the healthy and the sick.

### THE PLAGUE

as it prevailed on board H.M. Ship *Leopard* May, 1881

The following history of the plague and its results I wrote and I give Admiral Ramsay some details after

It struck me that there was not so much cause for alarm and dread as generally will be on such occasions. If ever no attack again I should not feel it so much.

The squadron of ships of war and transports under the command of Rear Admiral Blackton arrived at Suez on the 21st April 1881. The French left a couple days before. They had just arrived here by the plague. The body of one of a private state was being recovered in the dock of the town and again said that they had thrown some dead bodies into a well.

On the 21st a small detachment of troops were landed and Suez taken possession of. In the evening they returned on board. On the 22nd a considerable body of the 15th regiment were landed in a garrison. Finding that might be procured three sailors and two carpenters were sent from the *Leopard* — the British Midshipman who had seen the plague and had joined the *Leopard* at Suez last year, despatched from the French army in Egypt.

For some time they continued taking board and supplying the stores of a report existed that some of them were ill of the plague. That was certainly avoided. On the 23rd two men who had been a short time on shore died on board the *Four Eagles* of a disease complaint. This day an equal number of soldiers were sent to relieve those at first sailors they remaining on board. This was repeated I believe daily.

The 24 of May. On a report of Mr. Butler Assistant Surgeon R.N. with the party on shore I was offered by the Admiral with him to examine and report our opinion of the disease already strongly suspected to be plague. Several of those recovered from the shore were on board the *Adrian Smith* transport.

Proceeding on board that ship we found three men with fever, bilious vomiting in their stomachs and groans and complaining particularly of a head or chest. Great protrusion of tongue, the pulse weak, depression and tremor with delirium. On these five or six more were similarly affected, one belonging to the *Leopard*, a thin "and before

unmanned, sickly men who had been ill, now in a state of convalescence. These Indians and five more Europeans with the best of "sane days" reading, some with books. Several had already died. They generally were delirious. The recovery of any of them seemed very improbable.

Taking all circumstances into consideration, the particular symptoms of the fever, there remained no doubt with respect to its nature.

The room they were in was in an adjoining house near the bathhouse where they had been employed and in a street surrounded with old, massive buildings. We knew that they had been running among the old houses through the town in search of liquor and food. Upon further enquiry it was found several of the French had died in these buildings and several Arabs, chiefly in the town.

Before this period five communications had been allowed to take place between sick and well. Orders to prevent that were immediately given, the doors of the house built up according to custom and Arabs to be employed as nurses and attendants. All of them were returned to tents pitched without the garden, three on board the *Admiral* sent out on shore. On the 9th the three Malays and one of the Europeans had died. The convalescent natives continued to recover but several others were taken ill.

On the 10th in the night two of our officers and a surgeon on board were attacked with fever attended with much delirium and anxiety. In the morning the fever and delirium had left them but they continued to be much alarmed. On the 11th some men had died on shore. On the 11th during the night the surgeon was again attacked in bed with the addition of his skin feeling cold and clammy and a particularly restless at his back. In the morning he was again better and he soon recovered. At this time the alarm was pretty general. On the 11th all the troops except the engineers and a detachment with the sick re-embarked on the smaller vessels and were not allowed to communicate with the rest of the squadron. This prohibition continued, though not with that strictness as given effect until the 20th when all the sick etc. were embarked with a number of articles from the stores on board one particular vessel.

On the 10th Major H. M. S. Subramaniam sailed with all of them for Fox but the disease seemed now to have entirely abated — some lately taken ill. The number had altogether not exceeding 11 or 12 and that including those who died from the Fox who I rather believe had a different complaint.

During the whole foregoing period the weather was pretty cool particularly in the night but all morning when the wind blew from the desert with sun enough. What number of Arabs died of the disease could not be ascertained. None of those employed as attendants were attacked and they never appeared on the beach alarmed.

From the above account I think the two following general observations may be made:

1st. That men were seized with the disease but those employed in the bath, houses or who were watching the old houses.

2nd. That none recovered it from sharing the sick or who nursed them except one — a Hindu servant of the surgeon — and he most likely met with the Indians.



It follows then that the infection must have been solely confined to the hotel house and some particular old houses, the steps had been so. That it was not confined to the air or to all the houses, nor was it so powerfully infective as shown by its attacking so few of those who frequently and daily attended the sick.

It would appear to have existed in a concentrated state in the infected places even when ventilation was not wanting.

The depressing nature of this seems to have existed in epidemic cases in the Maltese.

Nothing thus gives the facts and history of the disease our limited knowledge of the nature and cause of infectious fever so much as the dark and striking way through all religious extremely nervous as understanding to succeed for its real and proper cause etc.

There has been generally supposed found the most powerful means of destruction of thought in this case there cannot be a doubt but those men were first attacked who were employed in the kitchens where they were learning large fires. There is a strong suspicion of this. Probably the contagious matter or effluvia may have been rendered active by the heat within the house or in the old wood used for fuel. Old rags and clothes will generally be found in infected houses. There would no doubt be increased. It would hardly exist in the floor.

In the Maltese the disease is all proved mortal. They were particularly active in working. From their having been before the curiety of the plague they were the most alarmed.

The debilitating effects of fever have long been known to produce that state of body which favours the action of contagion. We had several attacks of the French being on their way to attack Sicily. To the Maltese this was extremely serious since they were all quarters from the French army last year. It necessarily was a dangerous point.

I was rather surprised that a disease had to be so extremely and powerfully contagious should not have more rapidly spread its destructive influence, for although lately there were persons from visiting the sick, for some time previous the communication had been free. I have no doubt but the complaint the people of the *Empire* had was the effect of this alone.

Finally I conclude that although every precaution ought to be taken with the utmost strictness and duly enforced, particularly that of separation with as little access as possible, yet it does not appear to have been in the present case so as to greatly afflictions as we have been led to believe.

The opportunity I had of seeing the disease was too short and limited to enable me to make observations drawn conclusions or lay down rules. On the 23 of June St. John's day (and all signs of the plague ceased. The day of the time in the night fall heavy. Probably in this way he arrived in happy connection with us.

From the medical treatment adopted no persons followed. Rubbing the patient all over with oil is usually lately recommended was in one case tried without effect."

In June Admiral Blankin's ships left Sicily to return to Bantley. The health of the squadron was so bad that the admiral resolved to turn the *Admiral Beatty* into a hospital ship to which Thomas Robertson was appointed surgeon. His patients on board number 150 most of whom were suffering severely from scurvy and its concomitant — diarrhoea (food spreading about). Drinkings were in scanty supply there was an almost total lack of fresh food and cataplasms and an improvement was shown among the sick by the time the squadron reached Bloche. Then the men were taken ashore and Robertson set up a temporary hospital in two houses belonging to Europeans and secured ample provision of fresh meat, vegetables, and fruit. A month later he was able to write in his diary: All the sick of Admiral Blankin's squadron this day were removed from the hospital to the *Admiral Beatty* to be conveyed to Bantley. For the short time they were here their convalescence had been rapid, the lungs had cleared, liver healed with a capacity hardly credible. The day went up at Bloche certainly had a most favourable effect. Some probability may also be ascribed to the fruit, milk and fresh meat. Robertson wrote some forty years later James Lind published by Tronson on Scurvy and was almost intimately acquainted with the writings of Thomas Tronson, Lind's disciple. It is difficult therefore, to understand why the improvement in his patients was ascribed so much to a change of climate and so little to a change of diet.

The *Admiral Beatty* reached Bantley in the middle of August and Robertson rejoined the *Expedant*. After twelve more months spent in making visits he returned to Britain and during the next nine years served almost continuously at sea in the Mediterranean and all the Persian, Spanish and Portuguese coasts. Thomas Robertson was present at the battle of Trafalgar, took part in 1809 in the evacuation of the *Admiral Nelson's* army from Corunna and was one of the four fleet surgeons called on in 1810 to investigate the remarkably outbreak of scurvy, now called poisoning on board HMS *Porpoise* at Cadix (Hobbs 1929). The latter part of his professional life was spent in home waters and in naval hospitals and convalescent depots. After thirty six years of service he left the Royal Navy in 1829 and passed his retirement in quiet comfort in the South of England where he died in 1853.

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## ACROSS RUSSIA

By Stephen Cummings B. G. Redford, B.S.

It is remarkable how many people who are quite otherwise ordinary become complacent and blasé of you 'way out of town. My acquaintance that I contacted in travel to Hong Kong on the Trans-Siberian Railway was greeted with shouts of defiance and comments that I was dead to think I would be allowed to go; my Government would not allow it. 'The Russians would not allow it' and somehow I should have got in my application months or even years before! When permission was granted they said, did not quite give us but said: 'You'll be terribly bored. I should take some good books' and then looked slightly from where I said I could read books in an airplane but my intention was to look out of the carriage window at Russia.

In the end, although the trip was supported from the start, it took a few weeks to get almost approved whereas it took the Russians only eight days to grant my visa.

I broke my flight to Leningrad by stopping five days in Copenhagen where Danish friends made quite certain with a farewell party which included champagne and vodka, that I arrived in Leningrad slightly refreshed. I had changed to an Aeroflot plane in Helsinki and was almost disappointed to find how very like my other air hostesses the Russian ones were. We landed in Leningrad after dark and my first contact with something really Russian was the guard in his grey uniform with green facings and a beautiful grey fur hat, not to mention a formidable looking firearm. He boarded the plane and demanded my passport in a way I found difficult to resist. This was the first of many occasions that my passport temporarily disappeared.

One month later that the International Organization is invariably most efficient and on landing after customs and a most devoted declaration of all the money I was carrying, (don't believe me, but), their men proved me returned my passport and put me, my bag and a Persian map in a taxi with directions for it to take us to our hotel. Driving along, naturally made streets past our block of flats in the Leningrad suburbs, (all with the Persians) the cheapest sight that has stuck in my memory was of women sweeping the streets at half past ten at night. I was expected at the hotel and my bag was turned in, the taxi and postage being part of the bill or service for the hotel charge. Again the first demand was for my passport and this recurring theme became very irritating. They stupidly insist that they are 'registering' it but it is apparent that it takes as long to register it as the length of your visit. When having wasted two of the few hours I had in Moscow because of the passport, I finally announced that even in the backward African countries they can register a passport in a few seconds. All talk stopped, the type writer ceased and I was looked at as though I had uttered some ghastly blasphemy.

At first I was a bit down on luxurious long corridors as we found in the luxurious pre-Revolution hotel. This was understandable as a dignified sort of way and the bathroom must have been over 10th Century. The protocol of the lavatory shocked me at first when I sat down so that I was at a loss to understand how the plumbing worked. On this subject another difference I remember is that different ideas of what lavatory paper should be. Later on in another hotel, paper toilet napkins were supplied.

My first response was the restaurant where the faded pre-Revolutionary clothes were replaced by the current form of modern dress. A rather motherly waitress came to my aid and recommended the cream which was plentiful and cheap. There is none of the British taste about a table being white. If there is an empty seat you sit next and although you are in a first class hotel and are wearing a respectable English suit your neighbour may have no tie or even coat and may quite possibly prefer not to use his hands and feet.

I realise that what I have said may give the impression that I am hyper critical of the Russians but I hope shortly to dispel any such notions completely. What I have tried to do so far is to give my first impressions of a country and a people not too biased so much about but knows no bits of the true facts.

While occupying my room, before my meal, and when I had only been in Russia about a hour, the telephone rang. It was an acquaintance of the Arctic and Atlantic Institute who was he captured a life-long friend of my Russian counterpart (Dr. Semon) during my last Antarctic expedition, and as Semon was not well he was telephoning to welcome me to Leningrad and to say that he and an interpreter would call for me next day and show me round. The caller was Dr. Belashova and while Semon and I had been our respective countries' leaders in the Antarctic in 1956 for the International Geophysical Year, he had led a Russian expedition to Northern Greenland for the same purpose. Next morning he and the interpreter a charming girl who worked at the Institute, visited me in the hotel lobby and for the next three days nothing was too much trouble for them as they drove to entertain me. As a passport of introduction, Dr. Belashova produced from an inside pocket Dr. Semon's English Antarctic Club Tin which he had been given by the club when he was in England and which was the last occasion I had seen him.

Dr. Belashova, a short spare man with twinkling eyes and a splendid sense of humour, could not have been a more charming or kindly host. He is a man whose company and whose friendship, I shall always remember. We first went to the Arctic and Antarctic Museum which is housed in an old church and which I found rather distracting. I suppose the whole idea was so opposed to my upbringing. The place was well cared for and being originally a Russian Orthodox Church quite unlike churches that we are used to. Nevertheless the atmosphere of the old church persisted and in spite of the great interest of the displays laid for me, I still felt slightly out of place. We returned to my hotel on the morning which is so clean and truly pointed without a single advertisement and so well run that even I with virtually no Russian could travel so at home. Its delightful cleanliness was its most remarkable feature. Speaking of palaces, I do not understand why the term

People's Palace' of this and that is told. It is simply that, after the Revolution, the only buildings of any size that could be used were the palaces of noblemen.

Dr. Shalshin and Anna, the interpreter, took me all over Leningrad to museums and gardens, the Winter Palace, the Hermitage (which has the largest collection of Chinese in the world). When I said I would like to visit the Zoological Institute (named by Peter the Great) they explained that it was closed for numerous years. However, one day it was especially opened for me and the Professor of Zoology was willing to take me round.

We also went to a Russian film and when we arrived found that all the seats were sold. When they told the manager that I was a foreigner, three chairs were put in the gangway for us. We saw a beautiful colour film of a story by Pushkin called the Snow Queen which was quite one of the really outstanding films I have ever seen. There was also an excellent short film about the River Neva. During my visit the river was still frozen and little black figures, as I am so happy through lakes in the city. The river across the river to the slender golden spire of the tower of St. Peter and St. Paul gleaming in the unusually clear northern air was one I shall never forget.

Although obviously too tired well, next day he departed for a period on a command. Dr. Mikhail Semov, Head of the Soviet Union, entertained me to dinner at my hotel with Dr. Shalshin and Anna. We ate different sorts of fish and drink together. It was a delightful occasion for we had known each other for some years and an extraordinary thing is that we always enjoy each other's company although neither of us speaks the others' language and have to use an interpreter. After dinner we went for a walk down the Nevsky Prospekt. Here I saw what I had read about how the Russians love to stroll, especially along the Nevsky Prospekt even in temperatures below freezing. They were rather surprised that I did not wear a hat. From to my nose I had imagined from photographs I had seen that all Russian women wore elaborate coats of pelts. This clearly dispelled all preconceptions of such a misconception.

My three very happy days in Leningrad sped by all too quickly. Let me recommend it to any would-be traveller. It is a beautiful city and it is intriguing to realise that it was planned and built by Peter the Great in 1703. It was also interesting to find that the Russians greatly admire him and give him full credit. This surprised me for I never expected to hear them have a good word for any monarch. Settling by hotel bill with confusion, which I had actually paid for at Thomas Cooks in Portsmouth, I was driven to the Railway Station to catch the night train to Moscow. In my original itinerary, which had been expensively edited to transport to Moscow from home (there is no alternative) I had stipulated the day train and this had been accepted. But now 'they' had decided that I had to go by the night train (perhaps know why). Perhaps only profound ignorance saved me the moment that there were no day trains. I suppose all the travellers that have come to England must be wrong! Anyway this was to be my last journey on a Russian train and the first part of the legendary Trans-Siberian Railway route. The excitement and anticipation soon banished the memory of the back-brood official. Let me say here that during my whole journey I heard the ordinary Russians

freely happy and helpful. I am the first to admit that, of course, I am a white and unselfish alien, but the Eskimos seem to have a bigger share than any other country I have visited, although I have not met the American Eskimos who I am told are the worst. They must be terrible to hear some of the Eskimos.

Anywhere, they residing in the region was my town. The Red Arrow, whose name is now used, we took to childhood when I used to see my grandparents off on the Golden Arrow from Victoria on their annual return to the Koroit for the winter. The Red Arrow is a big and comfortable boat and part of my comfort is because it is so big. The boats are much smaller than ours so that the passengers can have two rows of double seats and a wide central passageway as opposed to our double and single rows. I went to my first class two berths deeper and prepared for bed wondering, with interest, what my companion would be for I had been told that they have no women in Alaska about making the voyage. Presently she slept beside me and I eventually looked like an *Edgar Allan Poe* but as it was a late middle-aged man who formerly spoke good English. In conversation I asked him if he was a businessman. This did not please him very much and I suppose not, unfortunately when it happened that he was not only a physician but also an Arctic explorer. But he forgot me, he thought me beautiful and meaning, and we were found we knew many names in common for he had frequently been to London, Oxford and Cambridge.

In Moscow as we landed the weather was sparklingly bright and lovely even if cool enough to make us wear a heavy coat. I found myself housed in the Hotel Uman, one of those very new and rather small buildings which seem common places in Russia now. My room was comfortable in a sort of impersonal way but the time the business was over, clean and efficient. After a bath, a shave, a washed breakfast, a few hours rest and attention over my passport, which naturally I signed last, I found my way to the nearest dock. There I found that a charming English widow in her late years, in Mrs. Murray was the only other English tourist and our young female guide was an attractive girl called Marguerite. She had an excellent sense of humor, an enthusiastic green jacketed but not the most interesting eyes of the same color. She wheeled us off to the Red Square which was surprisingly smaller than I had imagined. Starting across it was the long queue of women to Lenin's tomb. As long as we were allowed to go on with about half-way along. Lenin was looking a bit pale but the whole set-up was very impressive and had of all the ideas, always clearly moving, solemn of women. Then came the Kremlin. Here indeed was a surprise. The same had always appeared up such a plain, uninteresting picture but added it was bright and colorful and rather gay. Golden, open domes gleamed against a bright but pale sky and stars twinkled from the tops of double spires and even the quadrilateral fortress walls did not look unattractive. Perhaps it was the compare as well as the sun. Then into the Armoury where a museum started by the Tsar, a collection with its youth, crown, gold about fourteen very precious necklaces and beautiful dresses as well as earrings and watches including one given to a Tsar by Elizabeth I. Many of the floor was of lovely marquetry and everyone was supplied with felt over slippers to protect the surfaces. Mrs. Murray's slippers kept coming

added so I had to kneel and secure them. We got the newspapers after the first few times that the Russians wondered if this was not some sort of obscenity by Chaplains in the presence of such royal splendors.

Back at the hotel we tried to persuade Marguerite to have lunch with us, she was such excellent company, but she, very pleasantly and consistently declined. We imagined it was more than her job was worth to accept. That afternoon I walked to the Red Square, and back a long walk but you get so much more, of a place on foot than sitting in a taxi. I went into St. Basil's Cathedral the last time, took my coat with all the striped candy across my chest. I took several photographs and no one seemed to mind. In the evening Mrs. Murray and I went to the Bolshoi Opera and saw Rimsky Korsakov's Snow Maiden a beautiful spectacle but too long — walk over three hours. Exhausted we returned to the hotel and fell upon beds of near or total inactivity. We had some great fun.

It was on the third evening that I suspected I might be "bugged". I had under mind that dark, foreign men just into hotel rooms and to my complaint that I had about the service or the plumbing or the passport. I asked loudly as I do most well, in my bathroom in Moscow, which I was washing a dry-dry shirt and my hands. I noticed that two of the white glass tubs did not exactly reach the rest of the wall and I thought, Ah ha a microphone? and so gave them a casual chat with my hat and noisy underwear. I have since wondered since if I detected a microphone, or someone's eardrums.

Next morning I went off alone as a taxi to the railway station to catch my train for the long part of the journey, five days and nights, to Peking. I think I must have looked very English or somehow an obvious foreigner to the Russians for an entrance on Moscow was maintained out of the passport and secured the of being who I was, which I could not deny. By a rather wonder depth of hand he produced a paper and we proceeded on to the platform and those glancing dark green was my entrance train and waiting by the door was very tame and diminutive Chinese attendant. This was a Chinese train and after I left it at Peking it would continue through Mongolia to Peking. On the very journey I had originally wanted to do and would have done had it not been for the difficulties of English and Russians. My companions were numerous and of a standard of comfort I have never seen before or since. Two made beds — I could see either one, a table for a cracker, my own basket and a basin big enough to have a comfortable, stand up wash at. The furnishings were beautiful woodwork and the walls covered in a deep peach-colored patterned silk. One of the two Chinese attendants appeared inside my berth, produced a cup of delicious Chinese tea, a pair of simple slippers and some warm Chinese cigarettes obviously of ruled propaganda. Never once during the four days did either of these attendants smile. Perhaps these Chinese men being so much younger they were extra supporters of a Communist.

It was not long before I discovered that I was the only person on the train who spoke English and that there was only one other First Class passenger. I should say that they as opposed to Hanoi, a terminology not so intricately class conscious. He was a Chinese General. Whenever the train stopped, which was several times a day, a lot of passengers would descend the several steps to the platform and have a

walk to stretch their legs. I would be fascinated by the Russians and Mongolians here, the fireworks and greetings, the small boutiques selling the cheapest foods and cheap excellent bananas, while they in turn looked back at this strange apparition in a *Lavalure* suit, a navy blue shirtwaist and suede slippers. The women's interest seemed equally matched. Soon the General and I noticed we were the only *Sole Chair* passengers, in different coaches and then little boys were exchanged and we introduced ourselves. Goodness knows what his name was and I do not suppose he remembers it even undisturbed now. However, we established that he was Chinese and I was English. He spoke excellent Russian but, virtually no English although he was very keen to learn and we mostly conversed with the aid of my Russian phrase book. He was a distinctive man in his khaki uniform and I do not really know that he was a general but he had no rank and gold I felt he must be one and told him so. To which he gave the responsive reply: "Captains have three stars, *anyhow* I continued to call him General and he shut eyes because even now old lies. Since that we had made each other's acquaintance and as the train was moving again he disappeared with his companions. A few moments later he appeared in my elbow and looking up with an even wider grin and with great pride, "Say then, *Chap Chung*" to which I was rather hard to find a suitable reply. On our walk it was soon evident that my reply that I was a doctor did not really satisfy him and soon my reply was greeted with path (that was really good) of laughter and finally "No, no, you are military man!" I suppose because I said in that an upright way. This was funny to a point but might have led to trouble if he persisted especially in the wrong company, because although the Russians knew perfectly well I was in the Navy I was travelling as a civilian with a passport saving Doctor. Thus I had a brilliant idea and presenting the book General finally by our elbow. It opened the compartment to park him as under my arm I led him to my compartment and then showed him two books written by Dr. Treubnow the Governor of the Amur and Amursk districts. They were in Russian and were about Amursk exploration including an account of my last expedition. Apart from the photographs they were virtually unintelligible to me, but were given to me by Treubnow and as the *tylent* of such he had written a nice message, also in Russian. The General was most impressed, he almost gave a little bow and looking at me with a new respect said in English: "You must be very important man." We did not argue the point but there was no more nonsense about being a military man.

I wonder why people said I would be bored in the train? I suppose they must be people who never actually use their eyes or their ears but only passively like watching television. There was so much to be seen and to make of it now. At least once a day the attendants would wash the entire train as if it was covered with oil, and no-war window was kept side and clean. It would of course be easy to observe what you saw out of the window as trees and more trees, but how very misleading to see that short word to describe the slender grace of the bark trees' trunks emerging from the blue shadows on the water above and the delicate red trunks of their legs against a clear blue sky. Then there were the streams as clear as glass brown with water brilliant patches of patches of willow (the first species of *Sphen*) with trees with their arms downed slender women in colored head-



carriage-shipping the compressed stone to the rivers, individual by carload each and every one of them with a hard working team on a pole or line in the gorges: the eternal streamers of the barges so flat the milk water ran round in great puddles the rolling, virgin, fatuous forest that they call the 'Taiga' the surges of hatteries, over the waves, the mystery of two men on a fence drawn dead with their big hoop over the fence from one shaft to the other makes from anywhere (who were they?)—and where on earth were they going?) and the dream of seeing a beautiful white Arctic bear hopping away from the railway into the forest. To me it was a mystery how anyone could be brutal and if they were I would find very sorry for them. Even the vast new towns with their new industries were interesting to me for their identifying ugliness. Towns like Novosibirsk and Khabarovsk. Who would be forced to stand on a platform at the very end of the train at six in the morning, in the darkness of the early morning twilight, at the first stop after coming through the Urals to hear nothing but the rumbling of a stream of railful snow and a coach crowing, and to know you were in the very middle of the largest land mass on earth.

The meals were great too. The food was excellent for anyone. Here and there would appear an little nibble of food embedded in two hard eggs in a shallow bowl. How intriguing to order *Salmon Fish Bolly* and to find it was the pink bolly flesh of the sturgeon — very succulent and tasty. Pork Sausage, Roast Goose and *Cabbage* *Schupinka* soup, and delightful *cranberry* salad with a dressing of sour cream, fatigues leaving Red Caviar and new means to your feet course for breakfast. Thus the further we went the smaller the choice but the beer was pleasant and you cannot possibly eat caviar without having vodka. Later I found that the small caviar tin threaded were tightly pressed by the staff and eventually my several waiters asked if I had one more as there was only one tin left of the tin without one so I had to empty one and carry the eggs home. The Restaurant *Old Man Roman* as were the staff. My waitress was a charming girl with a slender steel tooth. We had amusing times conversing with the end of the menu and my phone book. She showed me great kindness and very charmingly declared a tip when I left. Occasionally some of the other passengers conversed with me, mostly by sign language and were surprised to smoke my cigars after which they insisted on buying me drinks. Alcohol is expensive but that never seemed to deter anyone. So in chortles I ordered a bar one day that would give fit at home and found I had to pay 10 for it. As we travelled East we should have shared our wretched but no-one seemed to worry so that when I got off in Irkutsk I found the cost of it being the paid mileage (okolow Time) a was five put five! Another fatuous girl and my and after much haggling and bargaining I got into my hotel where there was a double up over my room. Fortunately I was able to snatch a couple of hours sleep. After breakfast another delightful fatuous girl called Lanna collected me took me to an art gallery where I think I disappointed her by admiring conventional art instead of the most modern stuff. We then went to a park on the shore of the mighty Angara River and saw where the Whites and Reds had fought a big battle. I asked if I could take photographs and she said yes but not of the bridge, the very one I had intended to take. When I asked why not, and pointed to a man taking that very

empty. He explained that he was Russian. She was pleasantly surprised when I told her that in England she could take a picture of anything she liked.

After lunch, Loris took me to see his enormous dam and hydro-electric power station on the Angara. The station appeared to cover the ground was very brightly and very proud of his station, with good reason. Inside the vast power-hall, with the huge ubiquitous picture of Lenin on the wall I was invited to take pictures. Loris took a very shaky one of the engineer and me with Loris, pouring over our shoulders. You can hardly move in Russia without running into a line with pictures of Lenin and of other famous rulers everywhere. Modern Russians will tell you they are atheists but it is not true for they have deified Lenin and when you see what he did, and has caused to be done, in only seven years, you begin to understand the adulation he is accorded. Later that day I walked alone (I think) through the streets of Irkutsk to a handsome church and there, although it was a Monday, found a service taking place. The duty monks, presiding and assisting were a little overbearing and I was given badly and impudently looks and I too passed myself, having walked carefully to see I got it in the right order. There must have been fifty people in the congregation and although most were old, there were several younger men and even one woman.

Next day Loris and I went by car the 60 miles to Lake Baikal. The reason for my stopping off in Irkutsk. We sped along the rolling road through the eastern Siberian Tughi zone running parallel to the Angara which is the only outlet to the lake, although 336 miles, flow into it. It is the deepest lake on the world — 1,626 metres deep — 2,454 metres above sea level and is 603 kilometres long. It has few and these popular in small excluding fresh water seals left behind from the last Ice Age. It was still frozen, but nevertheless rare beautiful. We rented the best time when, I could see examples of the flora and fauna and looked at an old village of peaty little wooden houses evidently untouched by 'progress'.

Back in my hotel an Armenian official called Ken Garmatjanpourovich asked me to help him understand some phrases in the *Don's Wonder* which I did, but also gave him a short explanation of the problems of reading *The Tower* if he really wanted the story.

Whether I liked it or not, I had to fly the next day to Khabarovsk. I believe between the railway gate within 30 miles of Moscow someone really gave a compliment to my English. However, the weather was close and I had a unpleasant view of the endless mountains and the enormous Amur river that separates Russia from China. The aeroplane was comfortable if you ignored the dustiness and a person using a particularly pungent raw onion. I do not recommend Khabarovsk, perhaps because here I met the most inbred and obstructive of all officials. Also during my absence from the hotel my room was evacuated by me and I found the locks on the gap jammed whether or they tried to get in or not I do not know, but nothing was missing. However, a big disappointment was all the other travellers who passed me — Americans, Farsi, Yiddish, English, Germans and some Japanese Communists, as well as many English speaking Russians. I showed my hotel and my own compartment on the last stage of the train journey with a delighted American journalist who continually asked me with his thumb and forefinger

which no warnings from our above safe men could deter. All the Americans & Finnish businessmen. Generality Gervinko the Tsar correspondent returning to Tokyo and I had a morning meeting with the aid of Georgian Cognac, not very good but it helped.

Next morning we were travelling no longer but had South, on a new branch line which by going Vladivostok, Irkutsk to Pongson in the natural harbor of the new port of Khabarovsk. The weather too had changed and the leaves were beginning to burst on the trees. In Khabarovsk we saw no more than the customs, the depositors hall and the dockside. They are very busy about you not taking any Russian money out of the country and every Khabarovsk and Kopek had to be exchanged. It felt quite pretty when one Kopek gave half out of my pocket and we arrived at Hong Kong.

We joined the MV. Koida a modern and comfortable Russian ship for our first dry trip to Yokohama. The food was good and open very Russian but even more did the officers eat with the passengers. One evening we were invited to see a film with some interesting bits like: May the Sun Always Shine — or something. We all necessarily went and were then interested in the most interesting and boring propaganda film that lasted well over an hour about a woman's involvement in Moscow. There were recurring scenes of extraordinarily picturesque women giving one another with kisses and kisses of flowers and so if this was not enough some politically deplorable propaganda such as: Drown by hunger and want then the British ruled. Then we saw the Russian CND members being dealt with by the long suffering English politicians. When it was finished they looked quite surprised when we asked for a Mickey Mouse and even more so when we explained that a Mickey Mouse would be entertaining and intelligent. We found Gervinko in the bar and he explained, with a grin, that he had already seen the film. It did seem really to put on such rubbish as intelligent and educated people especially when I had seen what they could make with their Peking film in Leningrad.

An orchestra played in the smoking room each evening and singing and dancing took place. One night Tsang, who was an extremely fashionable Russian with a lovely voice and whose acquaintance I had made not only sang for me 'The Mountain Ash of the Ural' but also studied my back in a very respectful way while telling me what a good doctor I was.

Next day we reached Yokohama. There Ispay had arrived, the blossoms were out and the leaves fresh green. Pretty Japanese girls were their business. We no longer needed costumes. The streets were full of traffic and we experienced a popular sense of freedom. Then after five days in Tokyo I flew on to Hong Kong and his rather silly arriving on the boat of Kio Tak as a reward man with an even more interesting tale.

# A ROUGH DAY ON TRISTAN DA CUNHA\*

## Sergeant-Lieutenant Describes Terrors of a 'Two-hour Walk'

HMS *Jaguar* currently visiting Buenos Aires, nearly lost her doctor during the voyage from Cape Town to Argentina.

After ten days at sea, the *Jaguar* called in at Tristan da Cunha, a small British possession in the South Atlantic, with supplies for the islanders, and the resident doctor went there by the Colonial Officer asked that the ship's doctor be sent ashore to give a second opinion on two patients.

Dr J. R. Barker, R.N. went ashore as one of the ship's crew, and described it as a shattering experience.

The islanders' way of landing their boats,<sup>1</sup> he said, 'nearly made me get to the bottom of me as it was involving.'

After leaving the ship we rowed towards the shore and it all seemed perfectly normal until I saw the beach. Then I saw how we were going to land.

To land, the doctor said, 'we had to wait for the creek of what I thought was the largest wave in the whole of the South Atlantic, we waited in on that to a ramp, and then, before the wave could sink a strong barrier was erected and we were forced up to dry land by a tractor.'

But if the *Jaguar's* doctor thought his workday was over, as he readily says, 'I had another shock coming.'

After looking at the two patients for whom he had made the trip, he returned to the beach to discover the islanders' boat making her third trip had returned due to a cross wave and had lost her cargo of stores, including three outboard motors.

Dr Barker scolded with the Administrator 'who said that after he had lunch, a ship's crew could take him beyond the line of the beach, where he could be picked up by the whaler from the *Jaguar*.'

During that time Dr Barker was able to learn something of the island and her people.

The island was first discovered by a Portuguese called Tristan da Cunha, in 1506; the British took their over during Napoleon's expedition, after the French were when they returned a prison on Tristan da Cunha.

### Glenn Hughes

One of the corporals, William Glass of the detachment stationed there and two others obtained permission to stay on the island with their wives, and later they worked men and women joined them.

Now with a population of 118, the islanders on Tristan da Cunha have a normal society, all of whom are descended from the Glass family.

\* Published in *News* 2.2.1944 (Novel 12.1944).

The present, Krupung head, is a member of the Gilva family and, although he has to go by the administrator's ruling, he can be considered the tribal monarch, and the doctor said what is more, he looks the part—he has a long flowing, brown and silver, 'tail' with a nod of iron. There is no rank there or title on the island and so no question of police the 'Tribal Head' is all!

It was after his meal that the Royal Armed Forces ordered began. The situation decided that as the reef was so heavy and because the wind had increased with gusts of over 50 miles an hour that it was far too dangerous to launch a dinghy so the administrator decided that the safest way for Barker to get back to his ship was by sending him round to the forward side of the island.

Sergeant-Lieutenant Barker described his journey to the other side of the island.

#### *Sergeant*

Three guides were found and I was suspicious of the 'two hour walk' as the guides had supplied themselves with ropes and provisions.

At this time, a signal was made to the *Jaguar* saying that the only way they could pick up the doctor was to follow him on his walk to the forward side of Tinian Ch Coon.

After Barker and his guides had reached the top of a new path made since the eruption of 1941, it was then that the real climbing started. We reached the end of the path after 15 minutes then we were all roped together.

'A climb that started up the sheer face of the cliff, he added, and for me who has never climbed more than a staircase it was little less!'

After their climb, the doctor and his companions, creaked along a ledge which even now he claims never existed before, a ledge which Dr Barker comments 'could not be more than three inches wide' and at the same time he said, one of the guides told me that it was quite possible that 'owing to the rain that was coming, down in spots, we could easily have a few boulders falling on top of us!'

Three hours later the group reached the inside of the island—there was no sign of the *Jaguar*.

#### *Policeman*

While Barker became more pessimistic, the guides encouraged him by saying that with no more than three miles to go they were sure to find the boat from the *Jaguar*.

Finally they reached the beach, a small bay with no sand, but boulders.

Dr Barker described his feelings when he said 'I still could not see the *Jaguar*—it just lay haggard belovged to me and the biggest shock of the whole walk was when I tried to jump, just little blip!'

'As we staggered across the beach, illiterate, out on their heels and groined on. At last we saw a signal from a South African fishing boat which had just started to look out for us as well as the *Jaguar*.'

Then, through the dirty weather two Zulus appeared in a blue glass boat and asked me to start rowing. Then the captain gave me a much needed rest before I was put back into the dinghy to be taken back to the *Jaguar*.

Baker's last memory of the accident he had had was occurring, as he had checked about the paper: "I am worn out and I never want to see Treason again!"

Talking of her asparagus, yesterday, Surgeon-General Baker said, "I am glad I passed the Navy and I do not regret what happened to me on Treason On Parade." I liked the soldiers very much. Their speech is an Englishman's and his, strange—they kept using words like "that" and "that" and I found them pleasant, but they are friendly folk and I am pleased I met them.

# 'MY PURPOSE IS, INDEED, A HORSE OF THAT COLOUR'

## (TWELFTH NIGHT)

*(Sergeant Commander P. Rams collected this material with the co-operation of Surgeon Commander J. Ritchey and the Captain of HMS Victorious)*

On Tuesday 24th May 1944 HMS Victorious was in the English Channel returning to Portsmouth at the end of the first flying week up of her new commode unit. Shortly before making rendezvous for a RAN the following message was received from RFA *Grampian*:

*Report your doctor being released during S.S.S. to attend Chinese woman with terminal complaint. Patient has been confined to bed for three days*

After consultation with the PMO for more reasons than the obvious, the reply was made:

*Medical Officer will be transferred by light, pending reply by ship. 2 to Patient. Conditions if not a satisfactory result.*

The opening paragraph in this second paragraph was countered by *Grampian*:

*Confidence and integrity doubtful.*

Checkmate was accomplished by *Victorious* making

*Chinese speaking gynaecologist coming over.*

This undertaking was shortly fulfilled when Surgeon Lieutenant Commander G. S. Baines D FRCS MRSCOG-RNA was transferred.

Dr Baines was released for his daughter's Rector's Training otherwise he is a consultant gynaecologist in Hadow and Harley Street. His working knowledge of Cantonese which he had successfully acquired, had been acquired in the course of two years in prison practice in Hong Kong.

As matters turned out his ability was indeed of value. The patient had the signs and symptoms of a sub-acute appendicitis but also bore the typical story of an appendiceal operation. It transpired that he had been operated on in 1933 in the Far East for an acute appendicitis but that the appendix had not in fact been removed. The Oriental approach to surgery concerned incurable pain to Dr Baines. However the patient was transferred to *Victorious* and landed in Paris within the next morning on the belief that Occidental methods would triumph.

## NEW ANTE-NATAL CLINIC FOR MALTA

By Surgeon-Captain R. P. Phillips, R.N.

A new Joint Services Ante- and Post-Natal Clinic at Eastern Barracks, Durrës, was opened by Surgeon Rear Admiral M. H. Adams, CB, CBE, on 14 April, 1966. The clinic becomes part of the hospital services of the Royal Naval Hospital, Malta and replaces the very much outdated and inconvenient clinic that had existed for thirty years in Saint Street, Valletta.



*Surgeon Rear Admiral M. H. Adams, CBE, CB, with the new clinic.*

The clinic is sited on the ground floor of an Army barrack block, which has been entirely reconstructed. It is most conveniently situated near the main bus terminal which gives easy access from any part of Malta and has ample space for the parking of cars, prams and children which was so lacking in Saint Street.



The Clinic has three Consulting Suites, each consisting of a Consulting room, an examination room and two changing cubicles. The consulting rooms are air conditioned. There is a small treatment room also air conditioned. In the larger of the two waiting rooms is a nurse's area which is furnished with a Wandy House table and other children's paraphernalia.



Fig. 1. New Hope Hospital (Philadelphia, Penna.).

There is a large physiotherapy room fitted out as a classroom in that group instruction can be given. A well fitted dispensary room is packed close. The reception area is fitted with a central telephone switchboard connected to all departments and direct to RN Hospital switchboard. Patients are called to the consulting rooms by microphone from the reception area to a loud speaker on the waiting rooms.

The Clinic will care for approximately 800 patients a year and the staff are:

- 1 Consultant Psychiatrist
- 2 Specialist Psychiatrists
- 2 Senior Lecturers studying for DRDCO
- 1 QARMS Nurse
- 1 Patient Nursing Auxiliary
- 1 Physiotherapist
- 1 UHA for administration and dispensing
- 2 Secretaries

The Anti-racist Clinic and Post-natal Clinic are held each week. In due course Family Planning Clinics and Cervical Cytology Clinics will also be held at Lusaka.



Plan

- |                      |                                    |
|----------------------|------------------------------------|
| 1 Reception          | 9 Treatment                        |
| 2 Female W.C.        | 10, 11, 12 Consulting rooms        |
| 3 Small waiting room | 13, 14, 15 Examination rooms       |
| 4 Large waiting room | 16 Changing rooms                  |
| 5 Clinics            | 17 Patient meals                   |
| 6 Gymnasium          | 18 Dispensary                      |
| 7 Nurse unit         | 19 Post office                     |
| 8 Staff W.C.         | 20 Wardrobe                        |
|                      | 21 Storage for bed and Staff Boxes |

1. *See* *Waters, A. in: Hydrology and Land Use*, by W. C. Bracken, 1973, and W. D. Loomis, 1974, pp. 11-12, 13, 14. *See* *Hydrological Science: Studies in Human Dimensions*, pp. 130-1.

the following table compares the various points in changed anatomy and development in relation to the time to apex found and indicates a wealth of related information in the form of a summarized source found in *Principles of the Human Embryo* with a reference to the differences, properties and significance. It should be noted that what proved to be of great interest in detail and an excellent source, this table, and of the book.

There are two main types of change which demonstrate that the national system and the whole structure of the political organization in various countries is in permanent transition. Consequently, with a decline in liberal and neo-liberal expectations the movement from centrally to more de-central models of the role of national governments in the development and structure of nations in the present population and with only a small number of exceptions in the past and the future, the movement of de-central structures has provided a significant reality. Of necessity a large amount of vital resources is produced which can be called into being in the case where the need is so substantial and the national population is so vast, that the nation's economy is likely to be unable to provide the resources for the development of the country and the people. Therefore, in the long term, the movement of de-central structures is likely to be a significant and dominant one in the future.

Thus, that polymer can change during its use, with the degradation, separation and rearrangement of various hydrocarbon carbon atoms and related atoms comprising various sub components of that hydrocarbon and/or hydrocarbons compounds, cyclic compounds and aromatic chemical substances. As a result, the use is well suited and diversified and allows the polymer a somewhat useful for the average medical waste issues as it is defined in law, that a waste has been acquired without deriving from or under other law, 42 USC 6901.

The findings of *Survival* and all its associated problems were first discussed in three chapters covering its six stated core, important pages. All aspects of this difficult subject are covered over the course of the day to day problems of animal husbandry. It is an excellent approach of the subject and should provide much of interest to those with many interests in the subject of animal husbandry.

Chapter 12 is a long chapter of mostly one hundred pages or more in devoted to geometry, logic and natural science or cosmology. The discussion is interesting, full of interest as well as accurate facts, and provides a most interesting conclusion to the book.

There are three main types of "cognitive" therapy, which are based on the idea that people's thoughts, feelings, and behaviors are all interconnected. The first type is called "cognitive-behavioral therapy" (CBT). This type of therapy focuses on changing negative thought patterns and behaviors. The second type is called "rational-emotive therapy" (RET). This type of therapy focuses on changing negative thought patterns and emotions. The third type is called "mindfulness-based cognitive therapy" (MBCT). This type of therapy focuses on changing negative thought patterns and emotions by using mindfulness techniques. All three types of therapy have been shown to be effective in treating depression and anxiety.

[illegible]

The authors in this small book elegantly describe this evidence. It is a good well-written and presented and there can be few more supportive of this first of books given described if not were turned to explain. It may be said that these arguments are confined to 1970s time then may actually be the past and a possible solution.

Within the space of 100 pages the author has covered a very wide field and only a few lines are necessary for chapters on language, health, mathematics and scientific enquiry, religion, culture and spiritual growth, ethics, science and local communities etc. Another













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The record in Royal Naval Medical Service, on 22nd May, 1903. Promoted surgeon, to Transvaal on 25th May 1903 to Hospital Light on 1st December, 1902 and was placed on the Medical List with the rank of Surgeon from January on 1st February, 1903.

<sup>1</sup> *Journal of Interpersonal Violence* 22(7) 907-920. DOI: 10.1177/0886260507305566  
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The Journal of the Royal Naval Medical Service on 1st April 1951, was promoted to Surgeon Lieutenant on 2nd April 1951 to Surgeon Commander on 2nd April 1952 to Major General on 1st October 1952 and was promoted to Surgeon General on 1st April 1953. He was promoted to Surgeon General on 1st April 1953.

Reprints: Captain J. M. HAYES, LACP, U.S. Navy, School of the Line, 1988, at the cost of 50 copies.

The citation was signed by the United States Medical Service on 12th May, 1920 and presented to Surgeon General Cummings on 12th May 1920 to Surgeon Commander on 12th May, 1920 and was placed on the United LCC with rank of Surgeon Captain on 28 October, 1920.

\* Surgeon Captain T. J. DEHRIDAN, MB, BCh, RCd, died on 25th August 1961, at the age of 47. He joined the Royal Naval Medical Service on 1st April 1940, and was promoted to Surgeon Lieutenant-Commander on 1st April 1950, to Surgeon Commander on 1st April 1958 and was placed on the Retired List with the rank of Surgeon Captain on 26th September 1960.

<sup>†</sup> Eugene Douglas M. BROWN, M.D., ChB, Ed, died on Feb. 16, 1981, at the age of 66 years.

He entered the Royal Naval Medical Service on 11th June, 1913 and progressed to Hospital Local-Commissioner on 19th June, 1917 to Surgeon-Commissioner on 11th June, 1920 to Surgeon-Captain on 1st January 1924 and placed on the Medical List on 19th March 1924.

Sanjaya Chandra Mohan A. DRAGAM YODL, DPH, DTM, RM, RSH, and an MSc  
(Public Health, at the time of his death)

He married the Royal Naval Medical Officer, on 15th September 1907 was promoted to Surgeon Paymaster-General on 15th September 1914 and to Surgeon-Commodore on 1st January 1916. Awarded CBE in London Gazette on 1st January 1916. Awarded the Military Cross on 1st September 1915.

<sup>1</sup> S. S. Gurevich, *Izv. Vsesoyuzn. Nauchn. Ts. Akad. Nauk SSSR, Ser. Fiz. Nauk*, 1968, No. 10, p. 1691.

He entered the Royal Naval Medical Service as Third Officer, HMS *Goodwin* at Hong Kong in 1904, transferred to HMS *Orford* in 1906, to HMAS *Centurion* in 1907, and was attached to the British Legation, Tokyo in 1908.

Stephen Cassano (M) Aaron Thompson **SPONSOR** CRR 1254 (King and Ebel) had an amendment on with 14 members of the top of the Senate. It was a bill to amend the 1978 act and provide the National Guard with the right to use force in the event of a riot or civil disturbance. The amendment was approved by the Senate 10-4. The bill was then passed by the House 10-4. The bill was then passed by the Senate 10-4. The bill was then passed by the Senate 10-4.

During the Second World War he was recruited to the Royal Canadian Air Force (RCAF) in 1941 and served as Canadian Forces' transport on the east of the Canadian coast (1941). Afterwards, he was appointed RCAF in 1944 and was with CFB in the Bomber Command Unit in the United States.





FIGURE 1. Men in white uniforms.

NOTE: The men in white uniforms are the only ones who are not wearing hats.



## Index

### Authors

CLIFF, E. B. C. A Large Desaturated Cycl without Iron Supplementation	1
CLIFF, E. B. A. The Desaturation-Nitrite Effect and Auditory Threshold	125
CLIFF, E. B. A. Auditory Desaturation Associated with the use of the Air Turbine Dental Drill	87
CLIFF, E. B. A. A Six Year Prospective Study of the Effect of M. Anselmi Nitrite on Hearing	93
DAUGHERTY, D. G. Acute Noise	143
ELLIS, D. H. Salivary Electrode: The Head Influence System	128
ELIAS, P. F. The Health of the Navy in Two World Wars	3
ELIAS, P. F. Three Cases of Sensor Nystagmus	117
GEORGE, J. J. The Desaturation-Nitrite Effect and Auditory Threshold	23
GEORGE, J. J. A Six Year Prospective Study of the Effect of M. Anselmi Nitrite on Hearing	93
LEWIS, J. A. M. Two Cases of Retained Metallic Inter-Ocular Foreign Body	51
MAHONY, D. H. Aggressive Psychopathy	71
MAHONY, D. H. Drug Dependence	159
MAHONY, D. Habitual and Sporadic	78
NEWMAN, M. H. Acute Ulcerative Gangrene of the Vascular Type	94
QUINN, T. F. A History of Obesity in the Royal Navy	31
REYNOLDS, R. F. New Asia Hotel Closes for Goods	118
REYNOLDS, R. F. Symptoms of Malice	131
ROBERTSON, A. The Health of the Navy in Two World Wars	3
SMITH, A. F. J. Auditory Desaturation Associated with use of the Air Turbine Dental Drill	87
TAYLOR, A. H. The Management of Occlusal Problems and Maxillofacial Lesions Treated by Functional Appliances	98
WATSON, W. M. B. A Head Surgeon's Recollections with the Forces Since 1861	171

Salmon Rashes	165
Atypical Ulcerative Colitis of the "Viscous" Type	64
Aggressive Personality	70
Acute Nasal Closure for Males: New	173
Auditory Discomfort Associated with use of the Jet Turbine Dental Drill	52
'Background-Noise effect' and Auditory Threshold: The	23
Dermatome Cyst without histologic exposure: A large	7
Drug Dependence	195
Dysodontic Fits and Anatomical Lock: Treated by Periapical Nutrition The Management of	68
Epilepsy: Three Cases of Severe	117
Holmes: Surgeon of	111
Medicine and Sport	78
'My Purpose is indeed a House of That Colour' (Twelfth Night)	171
Obesity in the Royal Navy: A Review of	31
Fluorid: Sam 1958: A Hired Surgeon's Encounter with the	187
Prospective Study of the Effect of the Acoustic Noise on Hearing: A five year	92
Substance Abuse: The Blood Infection System	176
The Health of the Navy in Two World Wars	5
Two cases of Relapsed Metabolic bone Order Foreign Body	53
Treaties De Caste: A rough day on	134
Exposure of Old Medical Journals	56
Notes of the Service	41, 113 and 187
Reviews	41, 130 and 181
The Royal Navy Medical Club Dinner, 1966	97









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